

Aug  
2020

# समाचार पत्रों से चयित अंश Newspapers Clippings

A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology

Volume: 45 Issue: 180 02-03 August 2020



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## CONTENT

| S. No.  | TITLE   | Page No.     |
|---|---|--------------|
| <b>DRDO News</b>                                |   | <b>1-8</b>   |
| <b>COVID-19 DRDO's Contribution</b>             |   | <b>1-5</b>   |
| 1.  | Coronavirus   ICMR fast-tracks approvals for Israeli research coordinated by DRDO                             | 1            |
| 2.  | पताही हवाई अड्डा परिसर में DRDO के द्वारा बनाया जाएगा अस्थाई कोविड अस्पताल                                    | 2            |
| <b>DRDO Technology News</b>                     |   | <b>3-8</b>   |
| 3.  | DRDO weighs options to make indigenous light tanks  | 3            |
| 4.  | World's highest railway bridge over Chenab in J&K: All you need to know                                       | 4            |
| 5.  | DRDO's activities in Ladakh   | 6            |
| <b>Defence News</b>                             |   | <b>8-23</b>  |
| <b>Defence Strategic National/International</b> |   | <b>8-23</b>  |
| 6.  | Sainyavyapadeśa: Summons of the Indian Army to develop Self-Reliance in Defence Procurements                  | 8            |
| 7.  | Air Marshal VR Chaudhari assumes command of Indian Air Force's Western Air Command                            | 11           |
| 8.  | Rafales will provide India major advantage in Tibet in case of aerial combat: BS Dhanoa                       | 12           |
| 9.  | Purpose of S-400 and Rafale jet is to hit Pakistani aircraft inside its territory: Former IAF Chief BS Dhanoa | 14           |
| 10.   | Indian Army has edge over PLA in high-altitude war  | 15           |
| 11.   | China moves troops near Lipulekh Pass   | 17           |
| 12.   | Indian Army prepares to maintain current strength in eastern Ladakh during winter months                      | 18           |
| 13.   | As India, China hold fresh talks, Army stocks up on supplies, winter kits                                     | 19           |
| 14.   | Navy not keen on HAL for choppers, wants private sector to build alternate capability                         | 21           |
| 15.   | India, Sri Lanka express commitment to enhance bilateral defence ties   | 22           |
| <b>Science &amp; Technology News</b>            |   | <b>24-44</b> |
| 16.   | IN-SPACe mandate creates flutter in scientific community  | 24           |
| 17.   | Chandrayaan-2 rover intact? ISRO looking into new Nasa images   | 25           |
| 18.   | रोवर के चांद पर सही सलामत उतरने और कुछ दूर तक चलने के दावों की जांच कर रहा इसरो                               | 26           |
| 19.   | IISER team maps evolutionary dispersal patterns   | 27           |
| 20.   | Scientists discover new class of semiconducting entropy-stabilized materials                                  | 28           |
| 21.   | Specialized nanoparticles create a "breath signal" to diagnose diseases by analyzing a patient's breath       | 29           |
| 22.   | Researchers discover new drug targets for lethal brain cancer   | 31           |
| <b>COVID-19 Research News</b>                   |   | <b>32-44</b> |
| 23.   | First Pan India 1000 Genome sequencing of SARS- CoV-2 completes successfully                                  | 32           |
| 24.   | COVID-19: JNCASR Scientists develop forecasting model to estimate medical inventory requirements              | 34           |
| 25.   | COVID-19: Serum Institute bets big on Oxford vaccine as 'vaccine nationalism' looms                           | 35           |
| 26.   | BCG vaccine could slow down Covid-19 spread, says research but warns it's not a 'magic bullet'                | 37           |
| 27.   | Russia preparing mass vaccination against coronavirus for October   | 38           |

|     |  |    |
|-----|--|----|
| 28. | Single dose of COVID-19 vaccine exhibits strong protection in pre-clinical studies | 39 |
| 29. | Scientists figure out a weakness of coronavirus: Ordinary water                    | 41 |
| 30. | Can humans give coronavirus to bats, and other wildlife?                           | 42 |
| 31. | French researchers invent breath test to spot Covid-19 in the air                  | 44 |

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Mon, 03 Aug 2020

## Coronavirus | ICMR fast-tracks approvals for Israeli research coordinated by DRDO

*DRDO coordinating effort including transfer of data, saliva samples from 5000 patients*

*By Vijaita Singh*

New Delhi: The government has pulled all stops to help Israel conduct COVID-19 research on patients admitted to four Delhi hospitals, including transfer of saliva samples and patients' data to Israel, *The Hindu* has learnt.

The Defence Research and Development Organisation (DRDO) is collaborating with Israel's Directorate of Defense Research and Development (DRDD) to conduct trials on Indian patients that include an audio test, a breath test, thermal testing and a polyamino test to isolate proteins related to COVID-19.

### Ministry nod

The trial obtained "expedited approval" by the Health Ministry's Screening Committee (HMSC) chaired by Dr. Balram Bhargava of the Indian Council of Medical Research (ICMR) on July 28, a day after the Israeli team had arrived in India. The decision is yet to be endorsed by the full committee that is expected to meet in August.

Though the ICMR is the apex body for biomedical research and foreign-aided research in the country, the current trials will be controlled by the DRDO.

The DRDO proposes to transfer 5,000 saliva samples to the Israeli defence team.

The DRDO was forced to seek the approval of HMSC after the institutional ethics committees of two hospitals — Lady Hardinge Medical College and Hospital and Ram Manohar Lohia Hospital — where the patient samples are being collected, suggested that a final approval be obtained from the HMSC as the process involved "foreign collaboration."

The other two hospitals where the Israeli team will be conducting trials are Sir Gangaram Hospital and Lok Nayak Jaiprakash Hospital (LNJP).

### Conditions waived

However, Principal Scientific Advisor K. VijayRaghavan had written to DRDO Chairman Dr. Satheesh Reddy on July 27 that scientific departments of the government do not require to go to the HMSC.

Mr. VijayRaghavan stressed that COVID-19 research can be carried out in consonance with the guidelines issued by a vaccine task force constituted by the Prime Minister's Office (PMO) which enables the DRDO to take decisions on testing and sample sharing. He said the DRDO had the authority to decide the mechanism of conducting the experiments and what part of samples could be exported for collaborative research.



Israel's Ambassador to India Ron Malka interacts with the media at the Indo-Israel COVID-19 test camp in New Delhi's Dr. Ram Manohar Lohia Hospital on July 31, 2020. | Photo Credit: PTI

Mr. VijayRaghavan said it was a “research validation” study for which RT-PCR tests may have to be done on the participants and the positive results may be communicated to the ICMR in a way that does not impact the speed of the research programme.

While approving the trial on June 28, the ICMR chief expressed caution on handling of the saliva samples of COVID-19 patients as it may contain live virus and said as per 1997 guidelines for exchange of samples for biomedical research purposes, it was essential for information to be available in a central location — the ICMR headquarters.

### **No quarantine**

The Delhi Government has also waived the mandatory seven-day quarantine period for the 35-member the Israeli team.

In a statement issued on Friday, the Israeli Embassy said the trials are being conducted on a large sample of patients in India and if the results validate the effectiveness of the tests, they would be mass manufactured in India and marketed to the world by Israel and India jointly.

The statement said the trial of four different kinds of technologies that have the potential to detect coronavirus in as less as 30 seconds have started.

As reported by *The Hindu*, Prime Minister Narendra Modi and his Israeli counterpart Benjamin Netanyahu have held three telephonic conversations since the outbreak of the pandemic to discuss mutual assistance in dealing with the virus.

<https://www.thehindu.com/sci-tech/health/icmr-fast-tracks-approvals-for-israeli-research-coordinated-by-drdo/article32248603.ece>

## **स्वत्व समाचार**

*Mon, 03 Aug 2020*

### **पताही हवाई अड्डा परिसर में DRDO के द्वारा बनाया जाएगा अस्थायी कोविड अस्पताल**

मुजफ्फरपुर: कोरोना के बढ़ते संक्रमण को लेकर केंद्र सरकार की पहल पर बिहार में DRDO के द्वारा कोविड अस्पताल बनाया जाना है। इसको लेकर मुजफ्फरपुर में पताही हवाई अड्डा परिसर में 500 बेड का कोविड केयर हॉस्पिटल बनाने का निर्णय लिया गया है। टेंट में कोरोना मरीजों के इलाज की अस्थायी व्यवस्था होगी। डीआरडीओ की दो सदस्यों की टीम चक्कर मैदान, सीआरपीएफ कैंप, पताही हवाई अड्डा, एम आई टी आदि का सर्वे की। इस काम के लिए 8 एकड़ जमीन की जरूरत है।

पताही हवाई अड्डा को बिहार में कोरोना मरीजों के इलाज के लिए टेंटेड अस्पताल बनाने के लिए चुना गया है। जल्द ही इसका निर्माण शुरू हो जाएगा। पताही एयरपोर्ट कई मायनों में अन्य जगहों से बेहतर है। चक्कर मैदान व शारीरिक प्रशिक्षण महाविद्यालय में भारी जलजमाव है। यातायात व आइसोलेशन



की परेशानी होगी। झपहां स्थित सीआरपीएफ कैंप में पर्याप्त जमीन नहीं है। सुरक्षा व सुविधा के लिहाज से पताही एयरपोर्ट बेहतर है। पूरी जमीन पर चहारदीवारी पहले से है। साथ ही हाई लैंड है।

बिहार में तेजी से बढ़ रही कोरोना मरीजों की संख्या नियंत्रित करने के लिए केंद्रीय सरकार की पहल पर दिल्ली की तरह डीआरडीओ 500 बेड वाला अस्थायी कोविड अस्पताल का निर्माण करेगा। जिसमें 150 बेड वेंटिलेटर युक्त होगा। डीआरडीओ की टीम जमीन सर्वे के लिए बिहार के मुजफ्फरपुर स्थित चक्कर मैदान और पताही एयरपोर्ट का सर्वे किया।

ज़िलाधिकारी डॉ चन्द्रशेखर सिंह ने बताया कि बिहार में बढ़ते कोरोना मरीजों को देखते हुए केंद्र सरकार दिल्ली के तर्ज पर केंद्र सरकार को बिहार में भी एक कोविड-19 के इलाज के लिए बड़े अस्पताल का निर्माण कराना है जिसके लिए शनिवार को डीआरडीओ की टीम मुज़फ़्फ़रपुर में मुआयना किया।

<https://swatvasamachar.com/bihar-update/muzaffarpur/temporary-kovid-hospital-to-be-built-by-drdo-in-patahi-airport-complex/>

## DRDO Technology News

# Business Standard

Mon, 03 Aug 2020

## DRDO weighs options to make indigenous light tanks

*Ministry had planned to import such tanks to counter possible attack by Chinese troops*

*By Ajay Shukla*

New Delhi: The ministry of defence (MoD) last month fast-tracked the emergency purchase of light tanks to counter possible attacks by over 20,000 Chinese troops poised on the Ladakh border along with tanks, artillery, air defence guns, and road construction units.

To eliminate the costly and time-consuming import of light tanks, the Defence R&D Organisation (DRDO) has developed plans for building an indigenous light tank for use in mountains and in jungle terrain.

Arrayed on the Ladakh border is the People's Liberation Army's (PLA's) new light tank, the small, agile and versatile ZTQ 105 — also known as the Type 15 tank. To counter these, India's Ladakh garrison has just three tank regiments with a total of 150 old T-72 medium tanks. Weighing a hefty 42 tonnes, the T-72 is designed for the plains; movement on mountain roads is slow and often impossible. Given the limited elevation and depression of its heavy gun, the T-72 cannot engage targets on hilltops and in valleys.

In contrast, the Indian Army has used light tanks to great effect in the mountains. In 1944, it used Stuart and Sherman tanks in the battle of Kohima. In 1948, these same tanks pushed back Pakistan forces in the Zojila pass. Against China in 1962, the Army used light AMX-13 tanks in the battle of Gurung Hill near Pangong Tso and also deployed them in Bomdila and Dirang in Arunachal Pradesh.

In the 1971 Bangladesh campaign, French AMX-13 and Soviet PT-76 tanks played a stellar role in the battle of Garibpur.

Business Standard learns the DRDO has short-listed two options for developing an indigenous light tank within 18 months. Both these involve marrying the DRDO's tank development expertise created while developing the Arjun tank, with the defence manufacturing capability of companies such as Larsen & Toubro (L&T) that are already building the K9 Vajra selfpropelled gun system.

The first option involves creating a 34-35 tonne tank by fitting a 105 millimetre Cockerill gun turret onto a K-9 Vajra hull, powered by a 1,000 horsepower MTU engine optimised for high altitudes.

DRDO sources say this hybrid tank could go into production within 18 months.

The DRDO's second option retains the K-9 Vajra hull and MTU engine, but matched with the gun turret of the T-90S tank that the Army already uses. This 38-tonne tank would also require 18 months for going into production.

L&T is assembling the K-9 Vajra under licence from South Korea and will deliver its current order by next year. If the K-9 Vajra chassis is to form the basis for an Indian light tank, it would have to extend that licence.

The DRDO is confident that either of these hybrid tanks would be better options than what the MoD is considering buying: The Russian Sprut SDM1. They point out that the Sprut is a tank destroyer with old technology and that no other country has bought it. Since the Russian military has bought only 24 Spruts, it is not in regular production, making it hard to meet early delivery schedules and Russia would have to be approached for spares, overhaul and future upgrades.

The DRDO has earlier attempted to develop light tanks, but there was never any real interest from the Army. In the 1980s, the DRDO integrated the chassis of the Soviet BMP-1 infantry combat vehicle with a 105 millimetre gun, but the army was not interested.

Next, the DRDO mounted a French GIAT TS-90 turret and a 105 millimetre gun on the BMP chassis, which the Ordnance Factory Board was building in Odisha. Again the army was indifferent and the project was shelved.

In 2009, the Army's interest in light tanks was renewed with the sanction of two armoured brigades for high altitude operations alongside the mountain strike corps.

The Army issued a request for information (RFI) in 2009, but eventually T-72 tanks were deemed adequate and the RFI was abandoned.

Now, there is fresh interest with the possibility of encountering the PLA's new ZTQ 105 light tank, built by China's North Industries Group Corporation (NORINCO) and unveiled during the Zhuhai Air Show in 2016.

The ZTQ 105 has a 105 millimetre rifled gun that can destroy tanks at ranges of three kilometres and can fire anti-tank guided missiles that knock out tanks at ranges of 5 kilometres.

[https://www.business-standard.com/article/current-affairs/ladakh-standoff-drdo-weighs-options-to-make-indigenous-light-tanks-120080300060\\_1.html](https://www.business-standard.com/article/current-affairs/ladakh-standoff-drdo-weighs-options-to-make-indigenous-light-tanks-120080300060_1.html)

## THE TIMES OF INDIA

Mon, 03 Aug 2020

# World's highest railway bridge over Chenab in J&K: All you need to know

New Delhi: The world's highest railway bridge over river Chenab in Jammu and Kashmir will be ready by next year, and will connect the valley with the rest of India by train for the first time by 2022, officials said on Sunday.

According to the plans, Kashmir will be connected with train by December 2022.

Here is all you need to know:

### About the bridge

- The bridge, which has a central span of 467 metres, is being built at a height of 359 metres from the bed level. The height of Qutab Minar in Delhi is 72 metres and that of the Eiffel Tower in Paris is 324 metres.
- This is the tallest railway bridge in the world and the maximum designed wind speed for the bridge is 266 kmph, a senior government official said.
- The construction work of the bridge was accelerated in the last one year under the direct supervision of the top echelons of the central government, the official said



### **Connecting Valley with the rest of India**

- The arch-shaped bridge will connect Baramulla and Srinagar to Jammu via Udhampur-Katra-Qazigund covering the entire route in about seven hours.
- The Udhampur-Katra (25 Km) section, Banihal-Quazigund (18 Km) section and Quazigund-Baramulla (118Km) section have already been commissioned.
- The last remaining section, the 111 km Katra-Banihal section is currently under execution. It is targeted for completion in December 2022. The 126 km out of 174 km of tunnels on this section has already been completed.

### **Unique features**

- The 1,315-m-long engineering design will withstand blast and seismic activities, while the signalling arrangements would ensure the train does not encounter high wind velocity at that height.
- Trains can cruise at 100 kmph on the structure.
- The bridge will rise 359 metres over the Chenab, 65 km from Katra, on the 73-km Katra-Dharam section of the Udhampur-Srinagar-Baramulla Rail Link Project.
- The bridge can bear wind speeds of up to 260 km per hour and a minus-20-degree centigrade temperature.
- Over 5,462 tonnes of steel will be placed high over the river-bed and will be an engineering marvel.
- The railways has designed the signalling system at the bridge in such a manner that it shows the stop light automatically when wind speed is more than 90 kmph.
- Considering the inaccessible terrain of the Himalayan mountains, the bridge will get a special coat of paint with a life span of around 35 years to protect it from the tough weather.
- In securing the bridge, the Defence Research and Development Organisation (DRDO) played its part. Under DRDO's advice, the bridge has been so designed that even if one of the 17 piers supporting it is blown up, the bridge will not collapse. The deck of the bridge can withstand a heavy TNT blast.

### **Completion of the project**

- There has been a greater push in the last one year for implementation of various projects under the Rs 80,068 crore Prime Minister's Development Package (PMDP) announced on November 7, 2015, officials said.
- The programme touches practically every sector and provides for massive investments in basic infrastructure, another official said.
- After the reorganisation of Jammu and Kashmir in August 2019, the Union territory of Jammu and Kashmir was left with 54 projects under the PMDP with an outlay of Rs 58,627 crore. A total of nine projects with an outlay of Rs 21,441 crore were transferred to the UT of Ladakh.

### **Missed deadlines**

- The 1.315-km-long bridge awarded in 2004 has missed many deadlines so far. The first being February 2007 that was missed because of several issues including delay in designs sinalisation and court cases.
- Then from 2016 to 2018, several deadlines were missed due to many issues, including the 2014 floods in J&K.
- According to the ministry of railways, the deadline for the completion of the railway project has been moved ahead from June 2022 to December 2021.

<https://timesofindia.indiatimes.com/india/worlds-highest-railway-bridge-over-chenab-in-jk-all-you-need-to-know/articleshow/77315393.cms>



## DRDO's activities in Ladakh

*Dr Sudershan Kumar*

Since its inception, DRDO has been playing a pivotal role in fostering India's growth in the defence sector. Being the R&D wing of Ministry of Defence, Government of India, it has strived to achieve excellence with a mission and a vision to empower India with cutting edge technologies and to achieve self reliance in critical defence technologies and systems while equipping the armed forces with state of art weapon systems as per their needs in view of emerging security threats. The organization which started in the year 1958 merely as an Inspection agency has transformed over the years into one the most prestigious organizations of the country. With 54 R&D laboratories and a work force of around 7600 scientists and engineers, it has become an indomitable might. Over the years DRDO has not only made India Aatm Nirbhar in missiles, electronic warfare and under water technologies but also extended horizons in development of technologies in live sciences. Moreover, it has been the front runner in providing technological solutions to the problems faced by troops guarding our borders be it any terrain or area.



The Union Territory of Ladakh is one such not so congenial terrain. This cold desert region of Ladakh has a strategic significance for India by virtue of its location in Western Himalayas. It is bordered with Tibet to the east, Himachal Pradesh to the south Union Territory of Jammu-Kashmir and Gilgit Baltistan (ill legally occupied by Pakistan) to the west and south west corner of Xinjiang across the Karakoram pass in the north. This cold desert lying at an elevation varying between 8500 feet to 16500 feet from MSL characterized by low relative humidity, (20to40%), low atmospheric pressure, (493mmHg), low atmospheric oxygen high wind speed, very low annual precipitation and sub zero temperature up to (-40degree C) during winter months is too arduous for any living being. The extent of the extreme weather condition can be gauged by the plight of man sitting in sun under the shade who can have frost bite and sun stroke at the same time. For our soldiers giving

their duties in such incompatible and harsh conditions is unimaginable. To provide solution to soldiers deployed in this inhospitable terrain and to the inhabitants of the area, DRDO has provided number of technologies. These technologies include aloe vera cream to reduce cold injuries, wearable health monitoring systems which can be donned easily, non conventional energy based shelters, space heating and high altitude bio digesters. DRDO has also developed prophylactic supplements like herbal tea, sea buck thorn juice, sea buck thorn omega fatty acid capsules and UV protective cream for reducing high altitude adverse effects on soldiers posted in these inhospitable areas. Besides Food Research Laboratory of DRDO has provided number of Meal ready to eat (MRE) combinations for breakfast, lunch and dinner with caloric value around 450 kcal. One of the innovations in this case is the food which can be eaten without further processing or warming. Besides DRDO has also provided dual use technologies for the upliftment of socio economic conditions of local population of Ladakh. Firstly, in the field of agriculture especially the growth of vegetables and animal fodder, agro technologies such as trench greenhouse, double poly greenhouse, fibre reinforced greenhouse have found wide acceptance among the local farmers of Ladakh, who are able to grow 48 different varieties of vegetables throughout the year. As a result 70 to 80 percent needs of fresh vegetables are met through these local produce. DIHAR has also established dairy herds for distribution of high yield progeny, developed packages for poultry, survival gardens for medicinal plants and solar poly dryer for high altitudes. Besides, every year DIHAR organizes Kisaan, Jawan and Vigyaan mela at Leh and Partapur which provides common platform for interaction between armed forces and civil population. Presently at DIHAR R&D efforts are also going on for development of technologies for universal availability of non conventional energy resources in the region for generation of electricity and space heating applications. The research being pursued is on utilization of photovoltaic cell, solar concentrators and wind turbine for both electricity generation and space heating with objective to provide energy security at remote locations through in situ energy generation. These technologies, when matured at commercial scale can greatly reduce carbon footprints and dependence on fossil fuel in Ladakh region. Secondly, there is a scarcity of water in this cold arid region. Hence the judicious use of water in irrigation, drinking and for common use is imperative. Hence, standard low cost irrigation system (DIHAR), backpack high altitude water purifier with capacity 12 to 18 litre/hr (DLJ) and water mist systems (CFEES) have been developed.

Third, for better connectivity DRDO laboratories have also developed mountain foot bridge both with short and long span and high yield polymer concrete composite for emergency purpose. It is heartening to note that in the year 2020 unlike rest of the country the union territory of Ladakh is facing dual brunt of Covid-19 pandemic crisis as well as backstabbing by People Liberation Army of China by unilaterally changing status quo at Line of Actual Control (LAC). Till date in Union Territory of Ladakh nearly 1285 Covid-19 cases have been reported. Out of these 1063 have recovered. Still there are 218 active cases. There have been 4 deaths. These numbers may change. In order to test Covid-19 virus, DRDO has also established state of art test facility at DIHAR. This facility can test 50 samples per day and will be of immense use to future bio threats and for carrying out R&D in agro animal diseases. Besides DRDO has also developed a variety of protective gears against Covid-19.

As far as the hostilities by our adversary is concerned, according to latest reports, PLA has refused to disengage from finger four point of Pangong Tso lake area showing its adamancy despite all the diplomatic and military level talks. It seems, these Chinese are toeing the strategy by Mao's where in they aim to win war by hook or crook, paralysing the enemy, creating confusion in enemy's command and inflicting grave injuries to the enemy side both physically and psychologically. Indian authorities should take cognizance of this and be prepared for a long brawl. From the published and open literature, it emerged that DRDO has been once again on the forefront as it has developed drones called Bharat which could facilitate accurate surveillance along the Line of actual (LAC) in Ladakh. This is one of the most trusted surveillance system of the world. The small, yet powerful drone works autonomously at any location with impeccable accuracy. The unibody mimetic design with advanced released technology is a potent combination

of surveillance mission. The most important aspect is that this UAV can survive the most harsh climatic conditions. Besides, DRDO developed missiles have also been deployed in to counter Chinese build up at LAC. The author is of the opinion that the cost effective innovative technology will always play a key role for over all development of Ladakh. DRDO along with other research organization will have to play greater role in that.

<https://www.dailyexcelsior.com/drdo-activities-in-ladakh/>

## Defence News

### Defence Strategic: National/International



Sun, 02 Aug 2020

# Sainyavyapadeśa: Summons of the Indian Army to develop Self-Reliance in Defence Procurements

*Summons of the army is not just to our countrymen to join the ground forces but also to our scientists, engineers, innovators, entrepreneurs and youth to take up the challenge of indigenising defence production and procurement in India*

*By Dr. Mrittunjy Guha Majumdar*

The recent Galwan valley faceoff in Ladakh brought to the fore the momentous shift in policy, posturing and power of India when it comes to China, relative to the situation in 1962 in Nehru's India. A strong and yet measured military response by the Fire and Fury Corps of the Indian Army to the misadventures of Chinese troops in Galwan Valley, assertiveness by Indian defence forces, diplomats and politicians, cancellation of tenders and deals with Chinese entities in railways and communications, and the banning of well-known Chinese apps such as TikTok.

This may have been India on a measured offensive, but the brazen attempts at intrusion by the Chinese in Ladakh brought two worrying issues to light: the major power gradient in Asia between India and China, and the willingness of China to use its clout, on the ground and off it, to make its points and assertions heard. This clout



Dhanush Artillery Gun

stems from myriad sources: from its preeminent position in world geopolitics to its investments across the globe

(and the economic clout thereof) to its troops on the ground. While India has been fast catching up in the first two, the last avenue of power-dynamics needs a little more work, as I see it.

The challenge India faces from its neighbourhood on the ground is significant, with China, Nepal and Pakistan recently posturing aggressively against India. China has been misusing the ambiguity of the border between India and China with around 23 disputed regions along the Line of Actual Control (LAC) to its advantage for decades, with them going so far as to claim even the undisputed and very-much-Indian Galwan Valley as their own this time!

Next only to the United States and Russia, the Chinese military today continues to grow alongside a local expanding Military-Industrial Complex. For 2020, China received a Global Firepower (GFP) PwrIdx of 0.0691 (with 0 being considered perfect) and is ranked 3rd in the

world. They have 26,93,000 total military personnel, 1,232 fighter jets, 281 attack helicopters, 3,500 tanks, 33,000 armoured vehicles, 3,800 self-propelled artillery, 3,600 towed artillery, 2,650 rocket projectors, 2 aircraft carriers, 36 destroyers, 52 frigates, 50 corvettes, 74 submarines and defence budget of \$237 billion.

On the other hand, we have a GFP PwrIndx of 0.0953, with 35,44,000 total military personnel, 538 fighter jets, 23 attack helicopters, 4292 tanks, 8686 armoured vehicles, 235 self-propelled artillery, 4060 towed artillery, 266 rocket projectors, 1 aircraft carrier, 10 destroyers, 13 frigates, 19 corvettes, 16 submarines and a defence budget of \$61 billion. The United States and Russia still sit on the top of the ladder with GFP PwrIndx of 0.0606 and 0.0681 respectively. Pakistan has a GFP PwrIndx of 0.2364 and is 15th in the world, Bangladesh has a GFP PwrIndx of 0.7066 and is 46th in the world, and Nepal has a GFP PwrIndx of 2.9891 and is ranked 122nd in the world.

While the military strength of India gives us the capability to handle the threats from any hostile neighbours ourselves, especially with the cold-start doctrine and the aversion to 'hot war' due to nuclear deterrents in the hands of India, China and Pakistan, there is one glaring issue that needs to be addressed to help bridge any military power gradients, especially between India and China – the indigenization of military equipment and defence infrastructure. This is the key to self-sufficiency and building strategic capability. In light of the Galwan Valley and Pangong Tso Lake Faceoff in Ladakh, India sought its defence purchases to be supplied by their allies such as France with a sense of urgency. However, the time between when that actually happens to a possible later escalation or a second standoff with China over Pangong Tso or Galwan valley leaves us in a precarious situation.

While war must be averted at all costs, one must be ready and equipped with the necessary equipment, weaponry and infrastructure to stand up against any level of escalation by an increasingly brutish People's Liberation Army (PLA) of China). The Indian defence-industry complex has developed significantly over the past few decades. As per the Defence Production Policy of 2018 (DPrP-2018), the Indian defence industry has a goal of becoming among the top 5 global producers of the aerospace and defence manufacturing with an export target of \$5 billion per annum by 2025.

As per Colonel Bikramdeep Singh (Senior Fellow, Centre for Land Warfare Studies), in his work published in the CLAWs journal in 2013, the Self-Reliance Index (SRI), defined as the ratio of indigenous defence procurements to the total expenditure on defence procurements in one financial year is only 0.3. India was also the largest importer of arms, by value, having imported 12% of the total global arms imports, for the period between 2013 and 2017. It's quite an irony that even though India is among the top 15 producers of defence hardware internationally, the existing defence industrial base is still unable to meet the requirements of equipment, ammunition and infrastructure of our armed forces.

However, things have changed in recent times, for the better, with the Make in India initiative by the Narendra Modi government. Under the aegis of this flagship programme, the development of a roadmap for promoting indigenisation and self-reliance in defence, efforts to reduce red-tapism and bureaucratic delays to increase ease of doing business in the defence sector, the establishment of Defence Corridors (in Uttar Pradesh and Tamil Nadu) for the creation the of a Defence Industrial Complex and replacement of the Wassenaar Arrangement List of Munitions with a Defence Products List that helped private-sector entities to help produce defence equipment were some of the measures taken.

Research and Development in the defence sector in India has grown significantly over the decades, with DRDO developing indigenous products like the BRAHMOS (a universal long-range supersonic cruise missile system that can be launched from land, sea and air), AKASH Weapon System, *Varunastra* (electrically-propelled anti-submarine torpedo), 125mm FSAPDS Mk-II ammunition for T-72/T-90 tanks, Main Battle Tank *Arjun*, Indian Small Arms System (INSAS) family, Under Barrel Grenade Launcher (UBGL), Advanced Towed Artillery Gun System (ATAGS), 75/24 Pack Howitzers (first artillery gun system developed indigenously), *Ishapore Self-Loading Rifle* (SLR), Multiple Launcher System (MLS) with three 84 mm *Light Weight*

*Launchers (LWLs)* on an automated platform, *Extended Range Anti-Submarine Rocket (ER-ASR)* and the guided *Pinaka* rocket system [5]. As a country, we also recently developed our own light combat aircraft – Tejas.

Even with all these achievements, there is still a long way to go. One of the major flaws in our drive to indigenization has been overdependence on the public sector, for both – research and development as well as for manufacturing. The Defence Procurement Procedure (DPP) 2020 goes some way in laying the groundwork from procurement from private sector entities as well as looking toward Private-Public Partnerships. I feel the armed services must be given the initiative, albeit with high standards of accountability, in procurement and improvement of products acquired preferably from indigenous market players.

As a nation, we could look towards making defence PSUs more competitive, corporatizing ordnance factories and using the PPP model in various avenues of defence production and procurement. Private sector entities must be encouraged to acquire (or ideally, develop) better technology through collaborations with international defence behemoths – the original equipment manufacturers, and actively look at generational improvements in technology through dedicated pursuit of cutting-edge research and development (R&D) in defence. In low-technology manufacturing segments, a *Joint Venture (JV)* approach with international manufacturers can be adopted. This was done recently in the case of Kalashnikov rifles with the launch of the Indo-Russian Rifles Private Limited rifle-manufacturing facility in Korwa (Amethi, Uttar Pradesh).

Recently, the government of India imposed a ban on import of certain weapons used by Indian armed forces and increased limits on Foreign Direct Investment in defence manufacturing hiked to 49% to 74% in a bid to boost Make in India Defence production. However, while eight selected types of ammunition are cleared for production under the flagship programme since 2017, there are various other such as ammunition for anti-material rifles that are still being imported. This needs to change. MSMEs and startups must come up with sophisticated technological solutions to the military challenge, with such technological developments potentially being used concurrently in civilian application to offset financial burdens that may be accrued.

The iDEX Defence India Startup challenge initiative may help encourage this. Larger enterprises and major private players must act as hubs of research and development (R&D), with an emphasis on the three areas highlighted by the Ministry of Defence – electronic chips technology, materials technology and engine technology – and manufacturing, while the smaller enterprises can provide ancillary support and spur competition to create a healthy, efficient and optimum self-sustaining defence production and procurement ecosystem in the country.

As we move into a new age of strength, sustainable development goals and self-reliance of, and in, India, the highly relevant *Sainyavyapadeśa* (सैन्यव्यपदेश) – summons of the army is not just to our countrymen to join the ground forces but also to our scientists, engineers, innovators, entrepreneurs and youth to take up the challenge of indigenising defence production and procurement in India. The neocolonialism effectuated by, and the monopoly of certain countries in, defence transactions and trade can only be broken if we supplement our existing capacity to produce defence infrastructure, equipment and ammunitions within our country. Let us concentrate our resources, minds and ingrown technological interventions to safeguard the interests, security and sovereignty of our motherland.

<https://www.opindia.com/2020/08/indian-army-defence-procurement-indigenous-manufacturing-make-in-india/>

# Air Marshal VR Chaudhari assumes command of Indian Air Force's Western Air Command

*Prior to his current appointment, he was the Senior Air Staff Officer of the Eastern Air Command  
Edited By Pushkar Tiwari*

## **Highlights**

- 1. Air Marshal Chaudhari took over command from Air Marshal B Suresh.**
- 2. He has flying experience of more than 3800 hrs that includes operational flying on fighter aircraft like MiG-21, MiG-23 MF, MiG 29 and Su-30 MKI.**

New Delhi: Air Marshal VR Chaudhari on Saturday (August 1, 2020) assumed command of the Air Officer Commanding-in-Chief of the Indian Air Force's (IAF) Western Air Command.

The Air Marshal took over command from Air Marshal B Suresh.

Air Marshal Chaudhari was commissioned into Fighter Stream of the IAF on December 29, 1982, as a Fighter Pilot.

In a career spanning nearly 38 years, the Air Officer has flown a wide variety of fighter and trainer aircraft in the inventory of IAF.

He has a flying experience of more than 3800 hours that includes operational flying on fighter aircraft like MiG-21, MiG-23 MF, MiG 29 and Su-30 MKI.

During his illustrious career in the IAF, the Air Officer has held numerous important appointments.

He was Commanding Officer of a frontline fighter squadron and has also commanded a frontline Fighter Base.



Photo credits: Twitter/@PIB\_India

As an Air Vice Marshal, he held the coveted appointments of Assistant Chief of Air Staff Operations (Air Defence), Assistant Chief of Air Staff (Personnel Officers) at Air HQ Vayu Bhawan.

He has also held the appointment of Deputy Chief of the Air Staff at Air HQ Vayu Bhawan as an Air Marshal.

Prior to his current appointment, he was the Senior Air Staff Officer of the Eastern Air Command.

The Air Marshal is an alumnus of the Defence Services Staff College in Wellington.

In recognition of his distinguished service, the Air Marshal was also awarded Vayu Sena Medal in January 2004 and the Ati Vishist Seva Medal in January 2015.

<https://zeenews.india.com/india/air-marshal-vr-chaudhari-assumes-command-of-indian-air-forces-western-air-command-2300022.html>

## Rafales will provide India major advantage in Tibet in case of aerial combat: BS Dhanoa

New Delhi: The Rafale aircraft will give India a strategic advantage in case of any aerial combat with China in the mountainous Tibet region as the fleet will be able to use the terrain to its advantage, destroy enemy air defence and incapacitate the surface-to-air missiles, former Chief of Air Staff Air Chief Marshal (retd) B S Dhanoa said on Sunday.

Dhanoa, known as the architect of the Balakot strikes, said the Rafale jets along with S-400 missile systems will give the Indian Air Force a major combat edge in the entire region and that India's adversaries will think twice before starting a war with it.

In case of Pakistan, he said the purpose of the S-400 and Rafale is to hit Pakistani aircraft inside Pakistani air space and not when they come inside Indian territory, adding the neighbouring country would not have responded on February 27 last year to the Balakot air strikes if India had the French-manufactured jets then.



In an interview to PTI, Dhanoa said the Rafale, with its fantastic electronic warfare suite and maneuverability, will be able use mountainous terrain in Tibet to its advantage and blind the enemy before India's strike aircraft penetrate hostile airspace to carry out their missions.

The former Chief of Air Staff also said that the Rafales being supplied to the IAF are much more advanced than the ones being used by the French Air Force as India had asked for something "more" due to requirement to operate in unique conditions like operations from Leh.

Five Rafale jets out of 36 arrived India last week at a time India is in the midst of a bitter border row with China in the high altitude eastern Ladakh region.

"Rafale has got a fantastic Electronic Warfare (EW) suite (SPECTRA), fantastic weapons and therefore are capable of protecting themselves electronically besides being able to use the terrain to their advantage," Dhanoa said.

"So they (Rafales) can play an important role in doing DEAD (Destruction of Enemy Air Defence) on the Surface-to-Air Missiles that the Chinese have put on Tibet.

"Once you take out those surface to air missiles, then other aircraft like Su30, Jaguars, even Mig 21s can go out and drop the bombs on the Chinese forces. The strike aircraft carrying bombs can put tonnes and tonnes of bombs on the enemy troops, freely carrying out their mission. But if you do not do DEAD then you will suffer a lot of casualties," he said.

The leading air forces globally carry out Suppression of Enemy Air Defence (SEAD) or DEAD using their top of the line aircraft or weapons before launching any major operation in hostile territories.

As the Chief of Air Staff, Dhanoa had strongly defended the Rafale deal when the opposition parties ramped up attack on the government alleging massive irregularities in the procurement. The top IAF brass led by Dhanoa played a key role in implementation of the mega deal.

"Against China there are big Himalayan mountains in between us which create serious line of sight issues. You can put a missile with a range of 300-400 kms on the ground in Tibet or in India. But it will only work within the line of sight," he said.

He said the Rafales, with terrain following capability, will give India a major capability enhancement.

"In air combat, the first thing that is important is information dominance, you get information and deny the enemy the information. The key role the Rafales will play in Tibet is information

dominance and in case of Pakistan, it is a major deterrent. Of course there will be other roles too," he said.

Asked about the comparison between the Rafales and J-20 fighter jets of China, he said the Chinese aircraft is not stealthy and presently, with its current engines, cannot supercruise unlike the newly-acquired Indian fleet.

In a beyond visual range (BVR) combat, he said Indian missiles are far superior than theirs.

The French avionics on board the Rafale are "far superior" than the Chinese systems in J-20s, he said.

"Hence in a BVR environment the Rafales are superior to the J-20s," he added.

"With the induction of the Rafales we will have a tremendous jump in capability. That's why I called both (Rafale and S 400) of them game changers. Both these platforms will give the IAF a tremendous capability jump. The Rafale in the air and S-400 on the ground.

In October 2018, India signed a \$5 billion deal to buy the S-400 air defence missile systems from Russia to bolster the IAF's air defence mechanism.

The 'Triumf' interceptor-based missile system can destroy incoming hostile aircraft, missiles and even drones at ranges of up to 400 km. The delivery of the missile systems is scheduled to begin next year.

"Both S-400 and Rafales are critical game changers. Rafale is a deterrent. The purpose of deterrence is not to fight a war. Purpose of deterrence is to make the other person think twice before he starts a war or a skirmish with you," he said.

He said the Pakistanis would not have responded on February 27 last year to India's Balakot strikes if India had the Rafale jets.

In this context, he also mentioned an operation by the IAF to drop bombs on a Pakistani post along the LoC in Kel sector in 2002, and how Pakistani Air Force never dared to respond to it.

"On August 2, 2002, we did bombing of a Pakistani post as the Pakistanis had intruded about 600-700 metres inside the LoC in our area and set up a post. We bombed with four Mirage 2000s and after that the Pakistanis never came back," Dhanoa said.

"The Pakistanis never ever dreamt of bombing an Indian post in retaliation because we had Beyond Visual Range (BVR) missiles on Mirage 2000, MiG 29 and the Su-30 Ks and they did not have any BVR missiles on any of their fighters," he recalled.

"They just kept quiet about it and just didn't acknowledge that something had happened and later on played it low key when the news did break in the international media! That is what is called deterrence," he added.

Asked whether India should consider procuring two more squadrons of Rafales as it makes operational sense, Dhanoa called it a good idea and said that it will be the "cheapest option" of getting a 4.5 generation fighter into the air force.

"We already have infrastructure for two squadrons. We do not need additional infrastructure for the next two squadrons. They will come, in my assessment, at 60 to 70 per cent of the cost of the current ones," he said.

"The cost of research and development for all India-specific enhancements have already been covered. The next two squadrons of Rafales will be the cheapest option of getting a 4.5 generation fighter into the air force," he added.

Dhanoa, who retired as the IAF Chief on September 30 last year, said having two more squadrons of Rafales will give the force a lot of strength.

"If you have 72-80 aircraft, it will match whatever F-16s the Pakistanis have got. It will be good for deterrence," he said adding it will make economic sense.

Dhanoa also thanked all the people who stood by the Rafale deal, including the defence minister, the civil servants, the then defence secretary, the director general (acquisition) and many others in the government.



"You have to give them full marks, because they stood by it despite many apprehensions. Normally everybody gets scared that this deal may be termed later as a scam and they may be hauled up by the investigation agencies after their retirement, or some other roving inquiry that may happen which may implicate them in the future. These people stood by it; we signed and executed the deal," he said.

Dhanoa said the political leadership also stood their ground and did not dump the deal.

"They were going into an election. You could have always opted for a soft option of setting up a committee. Everybody stood their ground. The national leadership, the bureaucracy. That is why you have the aircraft," he added.

Dhanoa also expressed happiness that the first squadron of Rafales will be part of the Number 17 Squadron, also known as 'Golden Arrows', based in Ambala.

"I am very happy...I was the last Commodore Commandant of 17 squadron. It got number plated in March 2012. It stopped flying in December 2011. Having celebrated our Diamond Jubilee in October 2011. Last year the Squadron has been resurrected and this year aircraft have finally come to the Squadron," he said.

"Golden Arrows have a very rich tradition. The Squadron has fought in all the wars. It participated in the Liberation of Goa, 1965 war, 1971 war, and it fought in Kargil," he added.

Dhanoa commanded the squadron during the Kargil war.

"In case, there is fighting in Eastern Ladakh, we will not miss it," the Air Chief Marshal (Retd.) said in a lighter vein.

<https://timesofindia.indiatimes.com/india/rafales-will-provide-india-major-advantage-in-tibet-in-case-of-aerial-combat-b-s-dhanoa/articleshow/77318393.cms>

**TIMESNOWNEWS.COM**

Mon, 03 Aug 2020

## **Purpose of S-400 and Rafale jet is to hit Pakistani aircraft inside its territory:**

### **Former IAF Chief BS Dhanoa**

*Rafale fighter jets will provide India major advantage in Tibet in case of aerial combat, says former IAF chief BS Dhanoa*

New Delhi: Former Chief of Air Staff Air Chief Marshal (retd) BS Dhanoa on Sunday emphasised that the Rafale aircraft will give India a strategic advantage in case of any aerial combat saying that purpose of the newly bought fighter jets is to hit Pakistani aircraft inside its air space and not when they come inside our territory.

In an interview to news agency PTI, Dhanoa said the Rafale jets along with S-400 missile systems will give the Indian Air Force (IAF) a major combat edge in the entire region and that India's adversaries will think twice before starting a war with it.

"The purpose of the S-400 missile system and Rafale is to hit Pakistani aircraft inside Pakistani air space and not when they come inside Indian territory." He said. "Pakistan would not have responded on February 27 last year to the Balakot air strikes if India had the French-manufactured jets then."



Former Chief of Air Staff Air Chief Marshal (retd) BS Dhanoa | Photo Credit: PTI

Earlier this week, the Indian Air Force received a huge boost to its capabilities with the arrival of the first batch of French-made Rafale aircraft. The five aircraft made the 7,000-km journey from France to the Indian sub-continent before touching down at the IAF's airbase in Ambala.

### **'Major advantage in Tibet'**

Talking about the ongoing standoff with China in eastern Ladakh, the former IAF chief said Rafales will play the key role in Tibet as it will be able to use Tibetan terrain to its advantage, destroy enemy air defence and incapacitate the surface-to-air missiles.

"Against China, there are big Himalayan mountains in between us which create a serious line of sight issues. You can put a missile with a range of 300-400 km on the ground in Tibet or in India. But it will only work within the line of sight," he said.

"Rafale has got a fantastic Electronic Warfare (EW) suite (SPECTRA), fantastic weapons and therefore are capable of protecting themselves electronically besides being able to use the terrain to their advantage," the former IAF chief added.

<https://www.timesnownews.com/india/article/purpose-of-s-400-and-rafale-jet-is-to-hit-pakistani-aircraft-inside-its-territory-former-iaf-chief-bs-dhanoa/630962>

# The Tribune

Mon, 03 Aug 2020

## Indian Army has edge over PLA in high-altitude war

*The PLA of today is different from the rugged army of Mao in 1962. That army had soldiers who had fought in the civil war and the Korean War and was a highly motivated force. Much has changed over six decades. The last war the PLA fought was against Vietnam in 1979 where it ended up learning some lessons itself*

*By Lt Gen Pradeep Bali (retd)*

While technology-driven platforms and Net-centric attributes of an armed force come to the fore when studying its capabilities, it is the human resource which populates it that is the real barometer of its true potential. Given the recent incidents on the LAC with China, it is relevant to assess this resource of the People's Liberation Army (PLA) vis-à-vis the Indian Army.

The debacle of 1962 has had a lasting impact on the Indian mind. Some figures, therefore, need to be considered. The contact battle at various locations lasted from October 20 to 24 in the first phase of operations and from November 17 to 20 in the second phase. The total force levels involved were approximately four divisions of the PLA against less than three divisions of the Indian Army. The air force was not used at all. The figures of total casualties suffered on either side have been gleaned from a Chinese, an Indian and a US source — A History of the Counter-attack War in Self-defence (Beijing, 1994); History of the conflict with China, 1962 (India, 1992); The Chinese PLA at 75 (US, 2003). The broad figures in all three almost match. The Indian Army had about 3,000 killed/missing and 4,000 prisoners of war (PoW). The PLA had about 2,000 killed and wounded.

This defeat has been squarely attributed to the national political and higher military leadership. The reversals were mainly in Kameng where a study of individual battles points clearly to operational and tactical incompetence. Acts of outstanding individual gallantry and fierce sub-unit and unit level battles, especially in eastern NEFA and Ladakh, notwithstanding in Kameng, it almost became a rout where commanders and troops lost heart.

The next conflict between the two armies was two short, sharp engagements in September and October 1967 at Nathu La and Cho La in Sikkim. The Indian Army suffered about 80 casualties, while the PLA had over 300 dead. The military leadership at the tactical level was sound and

resolute. Unfortunately, this incident is not as widely known as it would have helped in removing the scars of 1962 from the national psyche.

At Galwan, PLA soldiers, acting like a Shanghai street gang, and armed with spiked iron rods, attacked an unsuspecting, small verification party of the Indian Army. Recovering quickly from the surprise, the Indian troops inflicted a large number of casualties on the Chinese side. Only an authoritarian regime like the CCP could refuse to disclose the number of their fatalities.

There have been numerous standoffs between the PLA and the Indian Army, along the LAC in Arunachal, Sikkim and in east Ladakh, leading at times to scuffles, where the PLA came out worse off.

In June 2017, the Indian Army crossed over into the Doklam area of Bhutan, across the watershed in east Sikkim, to stop the PLA from constructing a road inside Bhutanese territory up to the Jampheri ridge, from where the terrain rolls down towards the sensitive Siliguri corridor. The standoff was resolved after 72 days, when the Chinese blinked and withdrew a short distance away, giving up the road construction project.

The PLA of today is very different from the hardy and rugged Red Army of Mao, which came across the Himalayas in 1962. That Army had soldiers who had fought in the civil war and the Korean War and was a highly motivated force fired up by nationalism and communism. Much has changed over six decades. The last war the PLA fought was against Vietnam in 1979, where it went to teach the Vietnamese a lesson but ended up learning some lessons itself.

Prosperity has come to China and with it a much better quality of life, especially for the Han Chinese. Starbucks and McDonald's have reached Khamba Dzong, a small Tibetan town and now a PLA cantonment, 20-odd km from the Indian border on the Sikkim plateau. In 2012, training in recruit training schools of the PLA had to be delayed since recruit targets were under subscribed as a result of rejection during selection on medical grounds, due to overweight and poor eyesight. The PLA is a largely conscript force, most of its members serving for two years and coming from families subject to the one-child norm, but also who benefited from the post-1979 prosperity. The PLA rank and file is from small families living in relative prosperity, in an authoritarian state. Definitely not the best human resource for an army with unsettled borders.

The PLA's recent reorganisation of its infantry and mountain divisions into mechanised brigades may be suited for the plains or expeditionary forces but the high-altitude borders with India along the LAC require deployment of adequate, well-trained and hardy foot infantry for prosecuting operations — offensive or defensive.

One may well ask that if the PLA soldier is not so motivated or hardy, then how did they initiate the Galwan valley gang-fight? The PLA troops were certain of taking the Indian soldiers by surprise with heavy numerical odds in their favour. They had not expected a quick and fierce Indian reaction and suffered heavy casualties.

The PLA is the party's and not the nation's army. The party exercises control through the institution of the political commissar in the Chinese Army. Though a uniformed officer, he is the party's man, responsible for ideological indoctrination of the soldiers. In fact, he carries more clout than the officers directly in command of units. Thuggish behaviour such as at Galwan can partly be ascribed to such commissars. After the Galwan incident and happenings in China, political commissars will have a tough time keeping the PLA motivated and ideologically in line.

China is wont to boast of its technological prowess, military equipment, strategic support force and strategic rocket force. However, in the high mountains of the India-China border, it is primarily the foot infantry which will prevail in achieving military objectives. Pitched against the PLA is the Indian Army, with its very high level of unit cohesion, esprit de corps, a sense of izzat and a very hardy lot of motivated soldiers. The Chinese may well be found wanting in any conflict along these borders.

*(Lt Gen Pradeep Bali (ret'd), Ex-Commander, Sikkim-based 33 Corps)*

<https://www.tribuneindia.com/news/comment/indian-army-has-edge-over-pla-in-high-altitude-war-121379>

## China moves troops near Lipulekh Pass

*India and China have been engaged in a standoff in Eastern Ladakh beginning in early May that flared up on June 15 into the bloodiest clash between soldiers of the two countries in 45 years*

*By Shishir Gupta*

New Delhi: China has mobilised a battalion strength of People's Liberation Army (PLA) soldiers near Uttarakhand's Lipulekh Pass, one of the locations along the Line of Actual Control (LAC) where movement of Chinese troops has been noticed over the last few weeks outside of the Ladakh sector, people familiar with the matter told Hindustan Times.

India and China have been engaged in a standoff in Eastern Ladakh beginning in early May that flared up on June 15 into the bloodiest clash between soldiers of the two countries in 45 years. Twenty Indian soldiers and an unspecified number of PLA men died in the clash.

Three weeks later, both sides agreed to start disengagement and de-escalation of troops at the standoff points after a conversation between National Security Adviser Ajit Doval and Chinese foreign minister Wang Yi.

There has been thinning of troops at the standoff points, but the disengagement is still a work in progress.

Simultaneously, Indian military officers in Ladakh noticed a huge effort by Chinese troops to bolster their strength in their "depth areas," and give infrastructure projects on its side a hard push. Chinese troops have augmented their presence on its side of the LAC elsewhere too.

"There has been accretion of PLA troops across the LAC at Lipulekh Pass, parts of North Sikkim and Arunachal Pradesh," a top military commander said, requesting anonymity.

Lipulekh Pass, which falls on the Mansarovar Yatra route, has been in the headlines over the last few months after Nepal objected to an 80-km road built by India to the Himalayan pass. The Lipulekh Pass is also used for annual barter trade during June-October between tribal populations living on either side of the Indo-China LAC.

Kathmandu escalated tensions with India this year after it changed its political map to count the Kalapani area including Lipulekh - which lies close to the tri-junction of India-China-Nepal - as its own.

At Lipulekh Pass, PLA has moved a battalion - approximately 1,000 soldiers - at some distance from the border.

"It is a signal that the Chinese troops are prepared," a second army officer said. He added that India had matched the strength of the PLA troops and was keeping a close watch on Nepal in context of its recent border claims.

"The situation on the Line of Actual Control remains dynamic with the PLA trying to emphasise its presence beyond Ladakh by building infrastructure on their side of the LAC," the top military commander quoted above said.

In Ladakh and elsewhere, the troop movements and mistrust has led the army to prepare to station soldiers in the icy heights of Ladakh through the winter irrespective of how the disengagement and de-escalation efforts pan out.

The government has already sounded out its embassies in the US, Russia and Europe to locate manufacturers of high-altitude clothing and snow tent manufacturers for emergency purchases. If



The situation on the Line of Actual Control remains dynamic with China's PLA trying to emphasise its presence beyond Ladakh (Twitter/ITBP)

the supply still falls short, Plan B is to divert stocks from locations such as Thoise, the base station for soldiers deployed in the Siachen Glacier.

“It looks unlikely that we would be able to take our eyes off the border,” said the army officer, underscoring that this could be the only way for now to make Indian territory off-limits for an expansionist China and hold peace on the border.

“After the PLA aggression, we don’t trust the Chinese and fear that they will come back again north of Pangong Tso as summer arrives in 2021,” said the military commander.

Although the PLA has disengaged from patrolling points 14 (Galwan), 15-16 (Hot Springs), a smattering of adversary troops are still on forward location at patrolling point 17 A (Gogra) and withdrawal from all contested finger features is a distance away at Pangong Tso.

<https://www.hindustantimes.com/india-news/china-moves-troops-near-lipulekh-pass/story-nSE7PjSaGar6rGawwLoOkK.html>

## THE TIMES OF INDIA

Sun, 02 Aug 2020

# Indian Army prepares to maintain current strength in eastern Ladakh during winter months

New Delhi: The Indian Army is preparing to maintain its current strength of troops, tanks and other weaponry in all key areas in eastern Ladakh in the harsh winter months as a resolution to the border row with China in the mountainous region shows no signs of early resolution, people familiar with the developments said on Saturday.

They said the Indian Air Force (IAF) will also remain on high alert in the forward air bases along the Line of Actual Control (LAC) while the Navy will maintain its aggressive deployment in the Indian Ocean Region (IOR) to keep up pressure on China.

The Indian Army is making elaborate preparations for the long haul in eastern Ladakh even as it awaits confirmation from the Chinese military for the fifth round of military talks which was earlier expected to take place this week, they said.

They said the top military and strategic brass reviewed the overall situation along the LAC in eastern Ladakh and elsewhere on Saturday, adding Army chief Gen MM Naravane has been regularly updating defence minister Rajnath Singh on matters relating to operational preparedness.

Government sources said maintaining the current level of troops and weaponry in the high-altitude region will require extensive preparations as the temperature drops beyond minus 20 degrees Celsius in the region in peak winter months.

"We are preparing to maintain the current strength. That is the plan as of now based on the assessment of the current scenario," said a source.

Sources said the government has set the ball rolling in procurement of high-altitude clothing and other required equipment for its soldiers posted in the region.

They said the armies of the two countries are now expected to hold the next round of Corps commander-level talks next week to thrash out modalities to take forward the disengagement process from the Finger points at Pangong Tso.

India despatched thousands of additional troops and weaponry including tanks and artillery guns to their rear bases in eastern Ladakh following the Galwan Valley clashes on June 15 in which 20 Indian soldiers were killed. Subsequently, China has also strengthened its military deployment.



The Chinese side also suffered casualties but it is yet to give out the details. According to an American intelligence report, the number of casualties on the Chinese side was 35.

The Chinese military has pulled back from Galwan Valley and certain other friction points but the withdrawal of troops has not moved forward from the Finger areas in Pangong Tso as demanded by India, sources said.

India has been insisting that China must withdraw its forces from areas between Finger Four and Eight. The mountain spurs in the area are referred to as Fingers.

On July 24, the two sides held another round of diplomatic talks on the border issue.

After the talks, the ministry of external affairs said both sides agreed that an early and complete disengagement of the troops along the LAC in accordance with bilateral agreement and protocols was essential for overall development of bilateral relations.

The sources said India conveyed a firm message to the Chinese side that it has to implement the disengagement process as agreed to during the four rounds of Corps commander-level talks between the two armies.

Three weeks after the Galwan Valley clashes, National Security Advisor Ajit Doval and Chinese foreign minister Wang Yi held a nearly two-hour-long telephonic conversation on July 5 to bring down tension in the region. Both sides commenced the disengagement process from July 6 following the Doval-Wang talks who are Special Representatives for the boundary question.

After the fourth round of Corps commander-level talks, the Army said both sides are committed to "complete disengagement" of troops, adding the process is "intricate" and that it requires "constant verification".

<https://timesofindia.indiatimes.com/india/indian-army-prepares-to-maintain-current-strength-in-eastern-ladakh-during-winter-months/articleshow/77306475.cms>



Mon, 03 Aug 2020

## As India, China hold fresh talks, Army stocks up on supplies, winter kits

*Senior government sources have told NDTV, "We now need more of everything, clothing for individual soldiers, shoes, and additional stocks for everyone."*

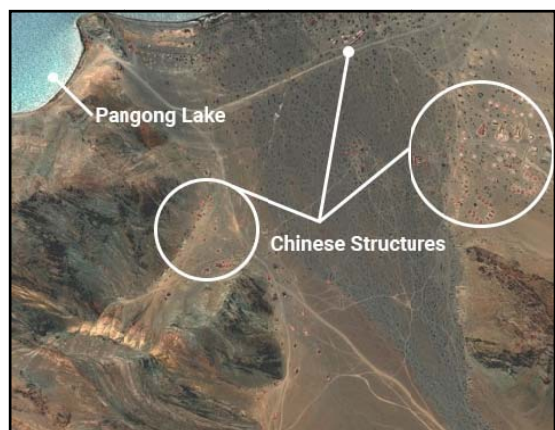
*By Vishnu Som*

New Delhi: With the process of disengagement between China and India taking time, the Indian Army, which is fully prepared to be forward-deployed in the Ladakh region, is in the process of stocking-up on essential supplies and equipment for the soldiers on the front, NDTV has learnt.

This comes as the two countries are holding the fifth round of military talks today where India will be keen to ensure substantive Chinese disengagement from the Fingers region along the banks of the Pangong Lake in Ladakh.

The Indian Army has massed soldiers in defensive positions in Ladakh to match the heavy Chinese deployment in the area. While NDTV will not report the numbers of soldiers deployed, it is widely believed that this is by far India's largest-ever deployment of forces in the Ladakh region.

All soldiers are authorised a high altitude, extreme-cold kit.



June 29, 2020: Chinese positions in Finger 5 and Finger 6 region. [Click here for high resolution pic.](#)

Senior government sources have told NDTV, "We now need more of everything, clothing for individual soldiers, shoes, and additional stocks for everyone."

Four foreign vendors have been identified with the bulk of the stocking expected to have been completed by November. At the moment, the Army is also looking to stock other basic provisions - "rations, kerosene and F.O.L (Fuel, Oil and Lubricant) stocking is well underway."

The Eastern Ladakh region where India and China have been involved in a tense face-off since April this year features some of the most inhospitable terrain on Earth, often at altitudes in excess of 16,000 feet above sea levels. Soldiers deployed have to fight the elements in as much as they need to be prepared to engage enemy forces.

Today's military talks being held in Moldo, on the Chinese side of Chushul, were decided upon last night and are expected to look at reviving the mutual disengagement of forces which have been stalled in most areas other than Galwan, the site of the June 15 clashes, in which 20 Indian soldiers including a Colonel were killed in hand-to-hand clashes.

The Indian Army also inflicted heavy casualties on Chinese soldiers in the area, the worst clashes between Indian and Chinese soldiers along the Line of Actual Control in more than five decades.

The latest satellite images of the Pangong Lake area of June 29 indicate that there has been no progress beyond the initial Chinese disengagement when they shifted their forces from Finger 4 to Finger 5.

Chinese soldiers continue to occupy positions in depth on slopes along Finger 5 and on slopes extending towards Finger 8. India believes the Line of Actual Control lies at Finger 8, near Fort Khurnak, a historic site in the area.

China believes that the LAC lies at Finger 4. Since April, China has prevented Indian soldiers from patrolling beyond Finger 4 after violent clashes there left dozens of Indian soldiers seriously injured.

The new satellite images continue to show the presence of a large number of Chinese fast interceptor boats on the Pangong Lake not too far from the Sirijap post where Indian and Chinese soldiers had clashed during the 1962 war.

The key focus of the fifth round of corps commander-level talks is expected to be finalising a framework for total disengagement of troops from friction points besides timely withdrawal of forces and weapons from the bases of the two armies, army sources said.

India had on Thursday in a statement that the process of disengagement of troops in eastern Ladakh has not yet been completed though some progress has been made. This was a counter to China's claim that frontline forces of the two countries have "completed" this exercise at most locations along their border.

Last week, government sources told NDTV that China has not pulled back troops from all the areas that it had intruded into Ladakh near the LAC in May.

China's troops are still present in the Dapsang Plains region, Gogra and the Fingers region along the Pangong Lake where India and China had started a mutual disengagement by creating a buffer zone between both sides, India had said.

<https://www.ndtv.com/india-news/as-india-china-hold-fresh-talks-army-stocks-up-on-supplies-winter-kits-2272845>

## Navy not keen on HAL for choppers, wants private sector to build alternate capability

By Manu Pubby

### Synopsis

**Sources said that the naval version of the Advanced Light Helicopter (ALH) that is being offered does not meet basic qualitative requirements and is unsuitable for the role required, including urgent Search and Rescue (SAR) missions at sea.**

New Delhi: The navy is not in favour of an offer by Hindustan Aeronautics Ltd NSE -0.85 % (HAL) for an upcoming Rs 21,000 crore Make in India contract as its chopper does not meet requirements and there is a dire need to establish alternative capability in the private sector to manufacture modern aircraft.

Sources said that the naval version of the Advanced Light Helicopter (ALH) that is being offered does not meet basic qualitative requirements and is unsuitable for the role required, including urgent Search and Rescue (SAR) missions at sea. As reported by ET, the naval utility helicopter (NUH) plan - originally planned for the private sector under the strategic partnership model - is going through a tussle after HAL entered the fray and has requested the government to be included.



"The ALH has a rigid rotor head and has been designed for high altitude operations, where it is very good at. The problem is that the design limits it in terms of the blade folding capability. In missions such as SAR, every minute is precious and the ALH just takes too much time to be deployed," a source said. While the navy is already operating the ALH in a utility role, it requires 111 helicopters for deployment onboard ships to carry out multiple roles, including surveillance and ferrying supplies. The requirement is urgent and a specialised chopper is needed that can be quickly deployed and retrieved and can be stored in the space constrained hangar onboard all vessels.

The process to acquire the choppers is already in advanced stages with four Indian companies shortlisted who can partner with a foreign technology provider to make the helicopters domestically. However, the final selection is stuck after HAL put in a representation. In the original tender document, it was specified that only private sector companies are eligible to take part in the contest.

Sources said that there is a need to have capacity in the private sector too for manufacturing modern aircraft and the NUH programme will enable the identified winner to procure technology and skills. Besides the navy requirement, the winning company will have a large domestic civilian market to tap, besides a robust export potential.

<https://economictimes.indiatimes.com/news/defence/navy-not-keen-on-hal-for-choppers-wants-private-sector-to-build-alternate-capability/articleshow/77295393.cms>



## **India, Sri Lanka express commitment to enhance bilateral defence ties**

Colombo: India and Sri Lanka have expressed their commitment to further strengthen the bilateral defence ties and jointly face the security challenges and concerns to ensure stability in the region.

The new Defence Adviser to the High Commission of India Captain (Indian Navy) Vikas Sood has had interactions with the leadership of Sri Lanka's Ministry of Defence and armed forces in the past week, the Indian High Commission in Colombo said.

Captain Sood paid courtesy calls on Sri Lanka's Defence Secretary Maj Gen. (Retd) Kamal Gunaratne on July 28, 2020, Acting Chief of Defence Staff and Commander of the Sri Lanka Army Lt Gen Shavendra Silva on July 27 and Commander of the Sri Lanka Navy Vice Admiral Nishantha Ulugetenne on July 29.

During these interactions, a range of matters of mutual interest in bilateral defence cooperation was discussed. Strong commitment to further strengthen the defence relationship between the two countries was reiterated by participants on both sides.

The interactions were marked by traditional cordiality and camaraderie between the armed forces of the two countries.

"It was noted that India and Sri Lanka enjoy a strong and growing defence relationship pillared on extensive cooperation in capacity building, such as through training, and other close linkages. More than 50 per cent of all foreign military training slots in India are allocated to Sri Lankan defence personnel," the High Commission said.

"It was observed that commonality of security concerns and challenges as well as the mutual resolve to address them for ensuring peace and security in our shared region guide the bilateral defence ties," the statement said on Saturday.

Regular high-level exchanges and visits, joint training and exercises, ship visits and sports interactions are the key elements of this robust cooperation," it added.

Both sides expressed satisfaction over several high-level exchanges and interactions between the two countries in the field of defence this year, despite the travel restrictions in the wake of the COVID 19 pandemic.

"Besides several delegation-level visits, Maj Gen (retired) Kamal Gunaratne along with Lt Gen Shavendra Silva, participated in Def Expo 2020 at Lucknow, India in February 2020," the statement said.

India expressed gratitude for the excellent cooperation by Sri Lanka Navy and Sri Lanka Ports Authority in the repatriation of Indian nationals from Sri Lanka in June 2020 when INS Jalashwa undertook a visit to the island nation.

"The smooth conduct of this operation is a testimony to extremely close ties between Indian and Sri Lankan Armed Forces," the statement said.

It was also noted that in line with the commitment of the leadership of the two countries to cooperate in facing COVID 19 challenges, India had extended essential medical assistance to Sri Lanka in recent months.

It was recalled that the Indian Navy had gifted two transportation pods for transferring COVID 19 patients and four thermal scanners to Sri Lanka Navy.

"In the context of sharing Sri Lanka's valuable experience in effectively fighting COVID, the recent participation of Maj Gen HJS Gunawardena, Chief of Staff of Sri Lanka Army in a webinar

organised by India for various partner countries including Bangladesh, Thailand and Myanmar to share best practices followed by Sri Lanka was appreciated," the statement said.

Meanwhile, Sri Lanka's Defence Secretary Major General (Retd) Kamal Gunaratne has said that historical relationship between China and Sri Lanka had been growing on the mutual trust built on pillars of political, economic, cultural, educational and most importantly in defence over the years.

Delivering the keynote address as the Chief Guest at the inaugural ceremony of the Chinese National Defence University (NDU) Alumni Association of Sri Lanka held recently, he said, China has been a historical ally of Sri Lanka across a multitude of avenues including Buddhism, trade, infrastructure development and global connectivity, Colombo Page reported.

"Sri Lankans will never forget the great cooperation extended by China during our hard times which we had to undergo during the recent past domestically and globally," the paper quoted Gunaratne as saying.

He also expressed his gratitude to China and the Chinese National Defence University for providing professional expertise in training the battle commanders in planning out counter strategies during the fight against the now-defunct LTTE.

China has been making significant forays into Sri Lanka, especially in the defence field. Beijing's activities have caused regional concerns, especially in India.

Sri Lanka in 2017 handed over the Hambantota port to China on a 99-year lease.

There are regional concerns, mostly from India, that China may make a military presence at Hambantota, located on a key sea international shipping route.

*(Disclaimer: This story has not been edited by Outlook staff and is auto-generated from news agency feeds. Source: PTI)*

<https://www.outlookindia.com/newscroll/india-sri-lanka-express-commitment-to-enhance-bilateral-defence-ties/1907873>

## IN-SPACE mandate creates flutter in scientific community

*Decisions of new set-up to facilitate private sector participation will be binding on ISRO and it will regulate launch dates and permit use of space organisation's facilities by private players*

*By Dhinesh Kallungal*

Thiruvananthapuram: The decisions of the newly set-up Indian National Space Promotion and Authorisation Centre (IN-SPACE), the single-window nodal agency, on the launch dates of satellites and rockets and use of facilities of the Department of Space's assets also by private players will be binding on all stakeholders including the Indian Space Research Organisation (ISRO).

The Department of Space published the roles and responsibilities of IN-SPACE, formed after the department decided to open up the assets for all with an aim to boost the private sector's participation in the space activities in the country, on the Isro's website. According to it, IN-SPACE will have a chairman, technical, strategic and legal experts in space activities, safety and from other departments, academia and industries, and members of the PMO and Ministry of External Affairs.

Moreover, it has been defined that the decisions of IN-SPACE, formed to allow space activities and usage of the department-owned facilities by non-government private entities (NGPEs) as well as to prioritise the launch manifest, shall be final and binding on all stakeholders. The NGPEs will not be required to seek separate permission from ISRO for using its facilities.

IN-SPACE will act as an autonomous body under the Department of Space (DoS) for enabling and regulating space activities. The new entity will draw up an integrated launch manifest considering the requirements of ISRO, NewSpace India Limited (NSIL) -- a central public sector enterprise of Government of India and commercial arm of ISRO -- and NGPEs based on priorities and readiness level.

According to sources, the new entity can decide on the launch of vehicles of ISRO and private entities, besides opening up the ISRO facilities for the private sector. This has invited sharp reactions from within and outside the space organisations. While the ISRO officially maintains that it's a win-win situation for both private and public sectors and the new decision will help the space agency to strengthen R&D, the decision has not gone down well with the employees and former staff.

Former ISRO chairman G Madhavan Nair told TNIE that this is an unwanted disturbance in the functioning of the Indian space programme. Trying to implement an unproven novel concept would result in killing the goose that lays the golden eggs, he said.

G R Pramod, general secretary of the ISRO staff association, said, "We have been protesting against this ever since the idea was mooted. We have written to the chairman, but the decision is somewhat political and we will continue our protest against the decision," he said.

### **Roles and responsibilities of IN-SPACE**

- Will draw up an integrated launch manifest considering the requirements of Isro, NSIL and NGPEs based on priorities and readiness level.
- Will work out a suitable mechanism for promotion and hand holding, sharing of technology and expertise to encourage participation of NGPEs in space activities.

- To carry out space activities, capital-intensive, high-technology facilities will be required by NGPEs. These facilities, spread across various ISRO centres, shall be permitted for use by NGPEs.
- Will work out a suitable mechanism to offer sharing of technology, expertise and facilities free of cost wherever feasible or at reasonable cost to promote NGPEs.
- Will act as an autonomous body, under DoS, as a single-window nodal agency for enabling and regulating space activities and usage of Isro facilities by NGPEs.
- Will also permit establishment of facilities, within ISRO premises, based on safety norms and feasibility assessment.

<https://www.newindianexpress.com/states/kerala/2020/aug/03/in-space-mandate-creates-flutter-in-scientific-community-2178292.html>

**THE TIMES OF INDIA**

Mon, 03 Aug 2020

## Chandrayaan-2 rover intact? ISRO looking into new Nasa images

By Chethan Kumar

Bengaluru: Nearly 10 months after Isro's failed attempt to soft land Vikram, the lander on Chandrayaan-2 mission that was carrying a rover (Pragyan), new images from NASA have rekindled interest in the mission.

Shanmuga Subramanian, a techie from Chennai who had identified Vikram's debris using Nasa images last year has now sent emails to the Indian space agency, claiming that the new set of images released by Nasa in May show Pragyan and even a track that indicates that the rover may have moved a few meters.



Isro chairman K Sivan, confirming this, told TOI: "We've heard nothing from Nasa so far on the matter. But yes, the person who had identified Vikram debris earlier has sent us an email about this. Our specialists are looking into the matter and we cannot say anything at this juncture."

The November 2019 images from NASA'S Lunar Reconnaissance Orbiter (LRO) showed the debris of Vikram lander. Given that Moon's polar region is not always well lit and the lander was in a shallow depth of 2ms from the surface, the rover was not visible from the November images.

"Going by the January 4 images (made public in May), however, I think Pragyan may be intact and that it has rolled out a few metres from the lander. We need to know how the rover may have moved and I hope Isro is able to confirm this," Shanmuga Subramanian told STOI.

He further postulated that Pragyan rolled out acting on some of the blind commands sent by Isro's ground command that was relayed by Vikram. However, Isro, which lost communication with Vikram in the early hours of September 7, 2019 has not been able to re-establish contact since.

The agency, however, had tried communicating with Vikram for multiple days after the hard-landing. One explanation to the rover's movement on Moon's surface, if the finding is accurate, would be that Vikram, which lost communication with the ground station, may have sent some commands to Pragyan which Isro never learnt about.

"We will have to analyse and see what may have happened. There is nothing concrete now," Sivan said.

<https://timesofindia.indiatimes.com/india/chandrayaan-2-rover-intact-isro-probing-nasa-images-chennai-techie-tips-off-agency/articleshow/77306442.cms>

## रोवर के चांद पर सही सलामत उतरने और कुछ दूर तक चलने के दावों की जांच कर रहा इसरो

**भारतीय अंतरिक्ष अनुसंधान संगठन ने कहा है कि वह चंद्रयान-2 के रोवर प्रज्ञान के चांद की सतह पर सही सलामत उतरने के दावों की जांच कर रहा है।**

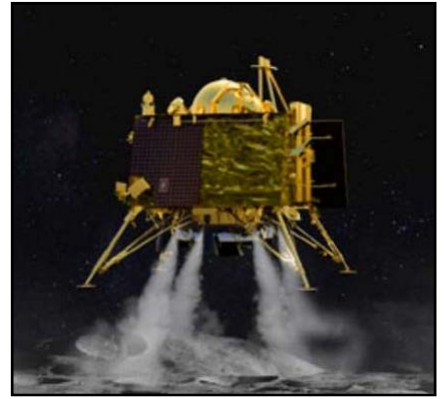
**चेन्नई:** भारतीय अंतरिक्ष अनुसंधान संगठन (Indian Space Research Organisation, ISRO) ने कहा है कि वह चंद्रयान-2 (Chandrayaan-2) के रोवर प्रज्ञान के चांद की सतह पर सही सलामत उतरने के दावों की जांच कर रहा है। चंद्रमा की सतह पर लैंडर विक्रम के मलबे को तलाश वाले शनमुग सुब्रमण्यम ने शनिवार को कहा कि ऐसा लगता है कि रोवर प्रज्ञान सही सलामत विक्रम से बाहर निकला था और कुछ दूर तक चला भी था।

चंद्रमा की सतह की तस्वीरों के साथ एक के बाद एक ट्वीट में सुब्रमण्यम (Shanmuga Subramanian) ने कहा कि प्रज्ञान चंद्रमा की सतह पर सही सलामत उतरा और लैंडर विक्रम से बाहर निकलकर कुछ दूर तक चला। इसरो के चेयरमैन के. सिवन ने कहा कि सुब्रमण्यम से जानकारी मिली है और उसका आकलन किया जा रहा है। सुब्रमण्यम ने कहा है कि कई दिनों तक लैंडर को कमांड भेजे गए थे।

इसकी संभावना है कि लैंडर उस कमांड को रोवर तक भेजा हो लेकिन संपर्क टूट जाने की वजह से लैंडर उसे पृथ्वी के नियंत्रण कक्ष तक भेजने में सक्षम नहीं था। नासा के लूनर रिक्ॉनैसैंस ऑर्बिटर (NASA's Lunar Reconnaissance Orbital) द्वारा इस साल चार जनवरी को ली गई तस्वीरों को ट्वीट करते हुए सुब्रमण्यम ने कहा कि इस तस्वीर में जो सफेद निशान दिख रहा है वो विक्रम का हो सकता है और जो काला निशान नजर आ रहा है वह रोवर प्रज्ञान हो सकता है।

बीते दिनों इसरो ने कहा था कि चंद्रयान-2 से मिलने वाले वैज्ञानिक आंकड़ों को वैश्विक उपयोग के लिए अक्टूबर से जारी किया जाएगा। इसरो की मानें तो चंद्रयान-2 के पेलोड्स से व्यापक आंकड़े हासिल हुए हैं। चंद्रमा पर पानी और बर्फ की उपलब्धता के संबंध में अध्ययन किया जा रहा है। इसके अलावा वहां उपलब्ध गैसों और खनिज पदार्थों के बारे में भेजी गई जानकारी का विश्लेषण भी किया जा रहा है।

<https://www.jagran.com/news/national-isro-checking-space-enthusiast-claim-of-moon-rover-rolling-on-lunar-surface-20582678.html>



**भारतीय अंतरिक्ष अनुसंधान संगठन ने कहा है कि वह चंद्रयान-2 के रोवर प्रज्ञान के चांद की सतह पर सही सलामत उतरने के दावों की जांच कर रहा है।**

## IISER team maps evolutionary dispersal patterns

*Study of biological movement is applicable to epidemiology, conservation and agricultural pests*

By Soumojit Banerjee

Pune: The prestigious U.S. biology journal *Evolution* has published the findings of a team of researchers at the Pune-based Indian Institute of Science Education and Research (IISER) dealing with the dispersal patterns of organisms across different environments.

The three scientists, Professor Suthirth Dey at IISER's Biology Department, Abhishek Mishra and Partha Pratim Chakraborty, carried out experiments to study the phenomena of 'density-dependent dispersal' by observing around 29,000 fruit flies to see if evolution had modified their tendency to move towards or away from crowded regions.

"Many animals, including humans, move from one place to another. Such 'dispersal' is generally to find resources like food or escape from potential threats. The study of this biological dispersal finds applications in epidemiology, conservation of biodiversity as well as control of agricultural pests," said Prof. Dey.

The scientists authored a paper titled 'Dispersal evolution diminishes the negative density dependence in dispersal', which was published in *Evolution* last week.

Mr. Mishra observes that a number of factors influence how, why or when individuals disperse, not least of it is their population density.

"This is similar to people's preferences of living in rural (low-density) vs. urban (high-density) areas. Populous areas often offer greater opportunities and more socialisation, but also incur competition for space and high costs. As a result, we can see movement of individuals from scanty to crowded areas, and vice versa, depending on the relative costs and benefits," he said.

Likewise, non-human species, too, experience similar pros and cons of 'high' versus 'low-density' areas.

"Just as some species live in large groups while others are solitary, movement occurs away from a crowd in some species and towards it in some others. This pattern, termed as 'density-dependent dispersal', is central to our understanding of which life forms occur where," says Prof. Dey.

Strangely, little is known about how or why 'density-dependent dispersal evolves'.

"In fact, there had been no report of an evolutionary change in the direction of this movement in sexually reproducing species. It was to address this that the team published their findings in the journal. If we don't know how the pattern of density-dependent dispersal emerges or changes over time, prediction of movement patterns becomes difficult," says Prof. Dey.

The team first "evolved" tens of thousands of fruit flies for over 75 generations (or three years), thus making them "better" dispersers than their ancestors.

"We observed around 29,000 fruit flies over this period to see if evolution had modified their tendency to move towards or away from crowded regions. Not only did we find a sharp change in this behaviour owing to evolution, but a crucial discovery was that the dispersal rates of males and females had changed completely," observes Prof. Dey, adding while females had been dispersing more than the males initially, the males overtook females in movement after evolution.

He said that this finding was perhaps the first evidence for an evolutionary reversal in the dispersal of the two sexes.

Prof. Dey says that by establishing that these behaviours are evolutionarily malleable, the study highlights the need to frequently assess movement patterns of ecologically relevant species.



Abhishek Mishra, left, with Professor Suthirth Dey at IISER. | Photo Credit: Special Arrangement

“On the one hand, moving further away from each other hampers the survival chances of endangered species. On the other hand, the very same behaviour accelerates the takeover of an ecosystem by invasive species. Similarly, this can affect pathogen spread via altered movement of disease vectors,” he said.

<https://www.thehindu.com/sci-tech/science/iiser-team-maps-evolutionary-dispersal-patterns/article32253915.ece>



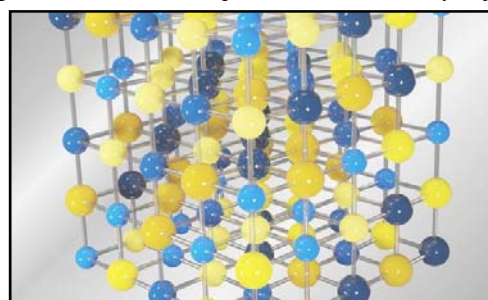
Sun, 02 Aug 2020

## Scientists discover new class of semiconducting entropy-stabilized materials

Semiconductors are important materials in numerous functional applications such as digital and analog electronics, solar cells, LEDs, and lasers. Semiconducting alloys are particularly useful for these applications since their properties can be engineered by tuning the mixing ratio or the alloy ingredients. However, the synthesis of multicomponent semiconductor alloys has been a big challenge due to thermodynamic phase segregation of the alloy into separate phases. Recently, University of Michigan researchers Emmanouil (Manos) Kioupakis and Pierre F. P. Poudeu, both in the Materials Science and Engineering Department, utilized entropy to stabilize a new class of semiconducting materials, based on GeSnPbSSeTe high-entropy chalcogenide alloys, a discovery that paves the way for wider adoption of entropy-stabilized semiconductors in functional applications. Their article, "Semiconducting high-entropy chalcogenide alloys with ambi-ionic entropy stabilization and ambipolar doping" was recently published in the journal *Chemistry of Materials*.

Entropy, a thermodynamic quantity that quantifies the degree of disorder in a material, has been exploited to synthesize a vast array of novel materials by mixing each component in an equimolar fashion, from high-entropy metallic alloys to entropy-stabilized ceramics. Despite having a large enthalpy of mixing, these materials can surprisingly crystallize in a single crystal structure, enabled by the large configurational entropy in the lattice. Kioupakis and Poudeu hypothesized that this principle of entropy stabilization can be applied to overcome the synthesis challenges of semiconducting alloys that prefer to segregate into thermodynamically more stable compounds. They tested their hypothesis on a 6-component II-VI chalcogenide alloy derived from the PbTe structure by mixing Ge, Sn, and Pb on the cation site, and S, Se, and Te on the anion site.

Using high throughput first-principles calculations, Kioupakis uncovered the complex interplay between the enthalpy and entropy in GeSnPbSSeTe high-entropy chalcogenide alloys. He found that the large configurational entropy from both anion and cation sublattices stabilizes the alloys into single-phase rocksalt solid solutions at the growth temperature. Despite being metastable at room temperature, these solid solutions can be preserved by fast cooling under ambient conditions. Poudeu later verified the theory predictions by synthesizing the equimolar composition ( $\text{Ge}_{1/3}\text{Sn}_{1/3}\text{Pb}_{1/3}\text{S}_{1/3}\text{Se}_{1/3}\text{Te}_{1/3}$ ) by a two-step solid-state reaction followed by fast quenching in liquid nitrogen. The synthesized powder showed well-defined XRD patterns



Crystal structure of GeSnPbSSeTe, a semiconducting entropy-stabilized chalcogenide alloy. The yellow atoms are cations (Ge, Sn, Pb) and the blue atoms are anions (S, Se, Te). The difference in lightness corresponds to different species of the anions and cations. The configurational entropy from the disorder of both the anion and the cation sublattices stabilizes the single-phase rocksalt solid solution, as demonstrated from first-principles calculations as well as experimental synthesis and characterization. Credit: Logan Williams, Emmanouil Kioupakis, and Zihao Deng, Dept. of Materials Science & Engineering, University of Michigan

corresponding to a pure rocksalt structure. Furthermore, they observed reversible phase transition between single-phase solid solution and multiple-phase segregation from DSC analysis and temperature dependent XRD, which is a key feature of entropy stabilization.

What makes high-entropy chalcogenide intriguing is their functional properties. Previously discovered high-entropy materials are either conducting metals or insulating ceramics, with a clear dearth in the semiconducting regime. Kioupakis and Poudeu found that the equimolar GeSnPbSSeTe is an ambipolarly dopable semiconductor, with evidence from a calculated band gap of 0.86 eV and sign reversal of the measured Seebeck coefficient upon p-type doping with Na acceptors and n-type doping with Bi donors. The alloy also exhibits an ultralow thermal conductivity that is nearly independent of temperature. These fascinating functional properties make GeSnPbSSeTe a promising new material to be deployed in electronic, optoelectronic, photovoltaic, and thermoelectric devices.

Entropy stabilization is a general and powerful method to realize a vast array of materials compositions. The discovery of entropy stabilization in semiconducting chalcogenide alloys by the team at UM is only the tip of the iceberg that can pave the way for novel functional applications of entropy-stabilized materials.

**More information:** Zihao Deng et al, Semiconducting High-Entropy Chalcogenide Alloys with Ambipolar Entropy Stabilization and Ambipolar Doping, *Chemistry of Materials* (2020). DOI: [10.1021/acs.chemmater.0c01555](https://doi.org/10.1021/acs.chemmater.0c01555)

**Journal information:** [Chemistry of Materials](https://chemrxiv.org/doi/10.26434/chemrxiv-2020-08-10)  
<https://phys.org/news/2020-08-scientists-class-semiconducting-entropy-stabilized-materials.html>



Sun, 02 Aug 2020

## Specialized nanoparticles create a “breath signal” to diagnose diseases by analyzing a patient’s breath

By Anne Trafton

### Exhaled Biomarkers Can Reveal Lung Disease

Specialized nanoparticles create a “breath signal” that could be used to diagnose pneumonia and other infectious or genetic diseases.

Using specialized nanoparticles, MIT engineers have developed a way to monitor pneumonia or other lung diseases by analyzing the breath exhaled by the patient.

In a study of mice, the researchers showed that they could use this system to monitor bacterial pneumonia, as well as a genetic disorder of the lungs called alpha-1 antitrypsin deficiency.

“We envision that this technology would allow you to inhale a sensor and then breathe out a volatile gas in about 10 minutes that reports on the status of your lungs and whether the medicines you are taking are working,” says Sangeeta Bhatia, the John and Dorothy Wilson Professor of Health Sciences and Technology and Electrical Engineering and Computer Science at MIT.

More safety testing would be needed before this approach could be used in humans, but in the mouse study, no signs of toxicity in the lungs were observed.

Bhatia, who is also a member of MIT’s Koch Institute for Integrative Cancer Research and the Institute for Medical Engineering and Science, is the senior author of the paper, which appears today in *Nature Nanotechnology*. The first author of the paper is MIT senior postdoc Leslie Chan. Other authors are MIT graduate student Melodi Anahtar, MIT Lincoln Laboratory technical staff



member Ta-Hsuan Ong, MIT technical assistant Kelsey Hern, and Lincoln Laboratory associate group leader Roderick Kunz.

### **Monitoring the breath**

For several years, Bhatia's lab has been working on nanoparticle sensors that can be used as "synthetic biomarkers." These markers are peptides that are not naturally produced by the body but are released from nanoparticles when they encounter proteins called proteases.

The peptides coating the nanoparticles can be customized so that they are cleaved by different proteases that are linked to a variety of diseases. If a peptide is cleaved from the nanoparticle by proteases in the patient's body, it is later excreted in the urine, where it can be detected with a strip of paper similar to a pregnancy test. Bhatia has developed this type of urine test for pneumonia, ovarian cancer, lung cancer, and other diseases.

More recently, she turned her attention to developing biomarkers that could be detected in the breath rather than the urine. This would allow test results to be obtained more rapidly, and it also avoids the potential difficulty of having to acquire a urine sample from patients who might be dehydrated, Bhatia says.

She and her team realized that by chemically modifying the peptides attached to the synthetic nanoparticles, they could enable the particles to release gases called hydrofluoroamines that could be exhaled in the breath. The researchers attached volatile molecules to the end of the peptides in such a way that when proteases cleave the peptides, they are released into the air as a gas.

Working with Kunz and Ong at Lincoln Laboratory, Bhatia and her team devised a method for detecting the gas from the breath using mass spectrometry. The researchers then tested the sensors in mouse models of two diseases — bacterial pneumonia caused by *Pseudomonas aeruginosa*, and alpha-1 antitrypsin deficiency. During both of these diseases, activated immune cells produce a protease called neutrophil elastase, which causes inflammation.

For both of these diseases, the researchers showed that they could detect neutrophil elastase activity within about 10 minutes. In these studies, the researchers used nanoparticles that were injected intratracheally, but they are also working on a version that could be inhaled with a device similar to the inhalers used to treat asthma.

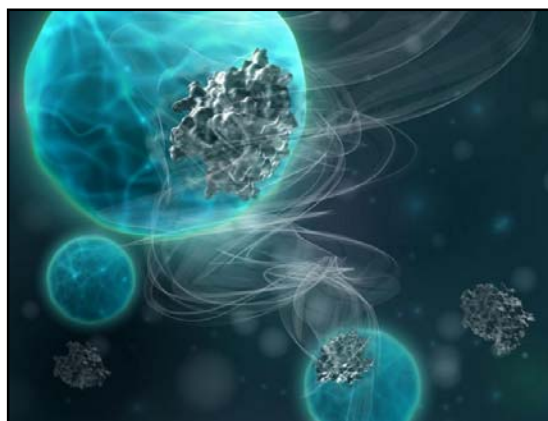
### **Smart detection**

The researchers also demonstrated that they could use their sensors to monitor the effectiveness of drug treatment for both pneumonia and alpha-1 antitrypsin deficiency. Bhatia's lab is now working on designing new devices for detecting the exhaled sensors that could make them easier to use, potentially even allowing patients to use them at home.

"Right now we're using mass spectrometry as a detector, but in the next generation we've been thinking about whether we can make a smart mirror, where you breathe on the mirror, or make something that would work like a car breathalyzer," Bhatia says.

Her lab is also working on sensors that could detect more than one type of protease at a time. Such sensors could be designed to reveal the presence of proteases associated with specific pathogens, including perhaps the SARS-CoV-2 virus.

**Reference:** "Engineering synthetic breath biomarkers for respiratory disease" by Leslie W. Chan, Melodi N. Anahtar, Ta-Hsuan Ong, Kelsey E. Hern, Roderick R. Kunz and Sangeeta N. Bhatia, 20 July 2020, *Nature Nanotechnology*. DOI: [10.1038/s41565-020-0723-4](https://doi.org/10.1038/s41565-020-0723-4)



MIT engineers have designed nanoparticle sensors that can diagnose lung diseases. If a disease-associated protein is present in the lungs, the protein cleaves a gaseous molecule from the nanoparticle, and this gas can be detected in the patient's breath.

The research was funded by a Global Health Innovation Partnership grant from the Bill and Melinda Gates Foundation; Massachusetts General Hospital; the Ragon Institute of MGH, MIT, and Harvard; Janssen Research and Development; and the Kathy and Curt Marble Cancer Research Fund.

<https://scitechdaily.com/specialized-nanoparticles-create-a-breath-signal-to-diagnose-diseases-by-analyzing-a-patients-breath/>

**THE TIMES OF INDIA**

*Mon, 03 Aug 2020*

## **Researchers discover new drug targets for lethal brain cancer**

London: With the help of a mouse model, a team of researchers has now discovered more than 200 genes with novel and known roles in glioblastoma - the most aggressive type of brain cancer that offer promising new drug targets.

Researchers from the Wellcome Sanger Institute, Addenbrooke's Hospital, and their collaborators engineered a new mouse model to show for the first time how a mutation in the well-known cancer gene, EGFR initiates glioblastoma and works with a selection from more than 200 other genes to drive cancer.

The results, published today in *Genome Biology* present the first mouse model of its kind, which is available for the research community to advance new treatments for this lethal form of brain cancer.



Glioblastoma is an aggressive form of brain cancer. It is treated with surgery followed by chemotherapy or radiotherapy, however, glioblastoma cells can evade treatment and tumours return. The prognosis is poor - the average patient survives for 12-18 months following diagnosis.

New, targeted treatments and immunotherapies are currently being developed to help glioblastoma patients. It is still not known exactly why glioblastomas begin to grow.

In a new study, researchers from the Wellcome Sanger Institute and their collaborators created a new mouse model with glioblastoma to investigate which genes were implicated in cancer.

The model showed that the well-known cancer gene, EGFR (epidermal growth factor receptor) can alone initiate the brain tumours to grow in mice, resulting in tumours that were highly representative of human glioblastomas.

Dr Imran Noorani, a corresponding author previously from the Wellcome Sanger Institute, and now based at Addenbrooke's Hospital and the University of Cambridge, said: "We have created a new mouse model for studying the lethal human brain cancer, glioblastoma. For the first time, we showed that the familiar cancer gene, EGFR is capable of initiating glioblastoma and we identified new driver genes, whose potential for therapeutic targeting deserves further exploration."

To identify which genes help EGFR to drive cancer, the team used the PiggyBac transposon technique - a small section of DNA inserted into different parts of the genome to introduce mutations. This revealed more than 200 known and novel mutations in tumour suppressor genes that were working with EGFR to drive brain tumour growth, many of which present new drug targets.

The team compared the results with human genome sequences from glioblastoma patients and uncovered many genetic mutations found in both humans and mice. Human genomic data contains many mutations implicated in glioblastoma, without a clear indication of which specific mutations drive cancer. With the new mouse model, the team were able to narrow down on which mutations drive glioblastoma, which will focus on future drug development.

Professor Allan Bradley, previously Director of the Wellcome Sanger Institute, and now Chief Scientific Officer of Kymab and Professor in the Department of Medicine, University of Cambridge, said: "Glioblastoma patients urgently require new, targeted therapies. Unfortunately, glioblastoma tumours can become highly resistant to therapies that target specific molecules, as there are many other genetic drivers that can 'take over' progressing cancer. This new mouse model provides the missing link to translate findings from new potential treatments tested on mice to clinical trials."

<https://timesofindia.indiatimes.com/home/science/researchers-discover-new-drug-targets-for-lethal-brain-cancer/articleshow/77315296.cms>

## COVID-19 Research News



Sun, 02 Aug 2020

### First Pan India 1000 Genome sequencing of SARS- CoV-2 completes successfully

Union Health Minister Dr. Harsh Vardhan has announced the successful completion of PAN-India 1000 Genome sequencing of SARS- CoV-2 in New Delhi today.

He took a meeting with Department of Biotechnology (DBT) and reviewed the COVID-19 activities of DBT, Biotechnology Industry Research Assistance Council (BIRAC) and DBT-Autonomous Institutions (AIs).

During the meeting, Dr. Harsh Vardhan also launched and dedicated to the nation the largest network of five dedicated COVID-19 Biorepositories established by Department of Biotechnology in record time.

These are at Translational Health Science and Technology Institute (THSTI) Faridabad, Institute of Life Science (ILS) Bhubaneshwar, Institute of Liver and Biliary Sciences (ILBS) New Delhi, National Centre for Cell Science (NCCS) Pune and Institute for Stem Cell Science and Regenerative Medicine (InStem) Bangalore. He complemented the efforts of DBT in "the relentless war for mitigation of this Pandemic".

Dr Harsh Vardhan said, "Given the importance of this information for public health response initiatives requiring investigation into the transmission of COVID-19, the sequence data will soon be released in Global Initiative on Sharing All Influenza Data (GISAID) for use by researchers across the Globe".

"The information in the database will improve our understanding on how the virus is spreading, ultimately helping to interrupt the transmission chains, prevent new cases of infection, and provide impetus to research on intervention measures", he added. The Minister also pointed out, "The data analysis, which is ongoing, may bring out some interesting conclusions to help in our fight against COVID-19."



Union Health Minister Dr. Harsh Vardhan has announced the successful completion of PAN-India 1000 Genome sequencing of SARS- CoV-2 in New Delhi today.

Dr. Harsh Vardhan also highlighted that “16 Vaccine Candidates are in different stages of development. The BCG Vaccine is undergoing phase 3 trial, Zydus Cadila DNA Vaccine is in phase I / II trial and 4 Vaccine candidates are in advanced stages of pre-clinical study”. “5 Good clinical laboratory practice (GCLP) clinical trial sites have been developed and 6 animal models for Vaccine Development Studies are also ready”, he said.

The Department of Biotechnology had launched a Pan India 1000 SARS--CoV-2 RNA Genome Sequencing programme in May this year to be done by Autonomous Institutes of DBT, collaborating with national laboratories and clinical organizations.

The consortium coordinated by National Institute of Biomedical Genomics (NIBMG-Kalyani), West Bengal and Five other National clusters, ILS-Bhubaneswar, Centre for DNA Fingerprinting and Diagnostics (CDFD)-Hyderabad, InStem- National Centre for Biological Sciences (NCBS)-IISc-Bangalore, and NCCS-Pune are actively participating in sequencing and analysis. Collaborating National Institutes and clinical organizations involved are ICMR - National Institute of Cholera and Enteric Diseases, Institute of Post-Graduate Medical Education and Research (IPGMER) -Kolkata, IISc-Bangalore, AIIMS- Rishikesh (Uttarakhand), Maulana Azad Medical College (MAMC)-Delhi, THSTI-Faridabad, Grant Medical College (GMC)-Aurangabad, Mahatma Gandhi Institute of Medical Sciences (MGIMS)-Wardha, Armed Forces Medical College (AFMC) and Byramjee Jeejeebhoy Government Medical College (BJMC)-Pune, and other hospitals.

The Consortium has achieved its initial goal of completing the sequencing of 1000 SARS-CoV-2 genomes from nasopharyngeal and oropharyngeal swabs collected from individuals testing positive for COVID19 by Real Time PCR. The samples were collected across 10 states covering different zones within India.

DBT is supporting COVID-19 Bio Repositories through a well strategized plan so that novel technological interventions can be developed in due course of time. The main purpose of these biorepositories are archival of inactivated virus and clinical samples, including naso-oropharyngeal swabs, stool, urine, saliva, serum, plasma, PBMC and Serum.

These designated bio repositories will use the clinical samples for R&D purpose and are authorized to share the samples with academia, industry and commercial entities involved in development of diagnostics, therapeutics, vaccines etc., after scrutinising the purpose of the request and ensuring benefit to the country. Standard Operating Procedures (SoPs) for sample collection, transportation, aliquoting, storage and sharing have been developed. As on date, 44452 clinical samples have been collected and stored in these five centres. More than 5,000 samples have been shared.

During the meeting which was attended by Dr Renu Swarup Secretary DBT, and joined through video-links by Senior officers of DBT and its Autonomous Institutes and Public Sectors BIRAC and BIBCOLD, the Minister was presented an update on the DBT-BIRAC COVID 19 Research Consortia under which more than 150 Research Groups have been supported involving nearly 80 Industry /Academia collaborations, 40 Academic Research Institutes and more than 25 Startup Research Groups.

The consortium has successfully developed 100 percent self-reliance for producing more than 5 lakh RTPCR diagnostic kits per day. 4 technologies of DBT AI's have been transferred to the Industry for commercial manufacturing of diagnostic kits. DBT AI's are also providing services for Diagnostic Testing, Kit Validation and Antiviral testing.

<http://ddnews.gov.in/national/health-minister-dr-harsh-varadhan-announces-successful-completion-first-pan-india-1000>

## COVID-19: JNCASR Scientists develop forecasting model to estimate medical inventory requirements

New Delhi: Scientists at the Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru have developed a forecasting model to estimate the key aspects of medical inventory requirements during the coronavirus pandemic, a statement said on Sunday.

The scientists of the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an institution under the Department of Science and Technology (DST), tested the model by predicting the number of infections and deaths in Italy and New York state, based on an adaptive algorithm which uses early available data. The predictions closely matched the actual outcomes, it said.

They have also carried out a similar exercise for India, where in addition to projecting the number of infections and deaths, they have projected the expected range of critical resource requirements for hospitalisation in a location.

The calculation is required to scale up both the testing capabilities and critical care facilities, which are essential to reduce mortality.

The team demonstrated that with this approach, there is universality to the evolution of the disease across countries, which can then be used to make reliable predictions.

This approach allows for planning of requirements for critical resources such as ICUs and PPEs during the pandemic. The approach is designed for simplicity of interpretation and adaptability over time, the statement said.

The model is based on the recent work of a team accepted for publication in the journal 'Physical Review E' in which they showed that uncertainties in parameters and reported infections can be compensated for by using (phase-space) representations.

"This reduces errors, exploiting any universality across geographies which shows similar behaviour, and by a regular weekly update of the predictions made for a month," it said.

"It would be extremely relevant for COVID-19, as the disease character and behavioural patterns of people change and affect the efficacy of disease spread and management, in a second-wave, requiring constant alertness on the part of the forecasters," the statement added.

DST secretary Ashutosh Sharma said mathematical modelling and simulations are some of the key tools for understanding, planning and decision making in the time of COVID-19.

"This example further brings to the fore the power of collaborations rather than competition among the best of research groups," he said. PTI

<https://www.tribuneindia.com/news/nation/covid-19-jncasr-scientists-develop-forecasting-model-to-estimate-medical-inventory-requirements-121195>



File photo for representation.

## **COVID-19: Serum Institute bets big on Oxford vaccine as 'vaccine nationalism' looms**

*Adar Poonawalla has said his company's ability to quickly scale production while keeping costs low is a key advantage*

Bengaluru: "Very few people can produce it at this cost, this scale and this speed."

This, as Adar Poonawalla told the *New York Times* for a profile the American newspaper ran of the CEO of Serum Institute, the world's largest vaccine manufacturer, is the company's principal advantage.

While a gradual trickle of vaccines are entering the final stages of clinical trials, and a plethora of drugs are being tested and often being awarded 'emergency use authorisations', manufacturers are staring at a gamble.

Either they make plans early to enter the market as soon as they can – even before they know if a given vaccine will prove to be safe and efficacious – and have a chance to set their price, or enter the market late, saddled with fewer risks, and also potentially lower profits.

To make this decision easier as well as to ensure their respective citizens won't face a supply shortage, American and European governments have promised vaccine-makers billions of dollars to offset potential losses. Most recently, as *Reuters* reported on July 31, "The US government will pay \$2.1 billion to Sanofi SA and GlaxoSmithKline Plc for COVID-19 vaccines to cover 50 million people and to underwrite the drugmakers' testing and manufacturing."

The Indian government itself hasn't announced any such schemes, although the Indian Council of Medical Research (ICMR), the National Institute of Virology and other notable government bodies at the forefront of the country's COVID-19 response are already working with Biocon Limit and Bharat Biotech – two major drug-makers – to catalyse tests and, potentially, production.

However, the *New York Times* also reported that India's Serum Institute is uniquely positioned because it is rich and isn't beholden to shareholders. As a result, the reporter Jeffrey Gettleman wrote, "It can make decisions quickly and take big risks, like the one it's about to, which could cost the family hundreds of millions of dollars."

Poonawalla's most prominent bet right now is a coronavirus vaccine being tested by researchers at the University of Oxford. This vaccine, currently designated AXD1222, is currently undergoing clinical trials in the UK, South Africa and Brazil. According to results of the phase I and II trials, published in *The Lancet* on July 20, the vaccine candidate appears to be safe and provoked a significant immune response in trial participants.

While this is encouraging, only the results of the phase III trials will determine the eventual fate of the vaccine – as well as of the investments of companies that have signed deals to manufacture and distribute it in different regions.

The biggest of them is AstraZeneca, which, the newspaper reported, has signed deals worth upwards of \$1 billion to sell the vaccine in the US and Europe, and some other geographies. Another of these companies is the Serum Institute, and its CEO Poonawalla has said his company's ability to quickly scale production while keeping costs low is a key advantage.

Even so, given the risks involved and the lack of state protection, Poonawalla said he's "70 to 80 percent" sure AXD1222 would pan out but also hoped "we don't go in too deep". This depth, he has estimated, is currently about \$450 million, or Rs 3,372 crore.

India has had an uneven history vis-à-vis vaccines. As Y. Madhavi, a senior principal scientist at the National Institute of Science, Technology and Development Studies, New Delhi, and a vaccine policy expert, wrote for *The Wire Science* on April 29 this year:

“As it happens, vaccine development and production has been one of India’s strengths for over a century, and the public sector has ensured we have been self-reliant and cost-effective. However, these enterprises were undermined by globalisation, and we began to depend more on imports. At the same time, privatisation increased our immunisation cost and facilitated the backdoor entry of frivolous vaccines.”

Indeed, the lack of government support for vaccine self-reliance has been a thorn in the country’s side, as exemplified by the case of the Central Research Institute, Kasauli; the Pasteur Institute of India, Coonoor; and the BCG Vaccines Lab, Chennai – which were suspended for not following good manufacturing practices by the same ministry that, as Madhavi wrote, was responsible for facilitating their compliance. These labs were reopened in 2012 but not before their closure triggered a vaccine shortage that the government decided to meet in the intervening years by increasing imports. Madhavi continued:

“Adar Poonawalla, CEO of the [Serum Institute in Pune] stated on NDTV on April 27 that his company has stopped producing some other vaccines to free up capacity for a COVID-19 vaccine being tested with the University of Oxford. What if any of those vaccines were important to protect against some of the more deadly diseases affecting Indians?”

But even as the Serum Institute, Biocon Limited and Bharat Biotech have stepped in to both solve an important problem – i.e. COVID-19 mortality – and cash in, this public-private skew within India is reflected at the global scale by vaccine nationalism, a simple phenomenon that precipitates a variety of consequences. For example, as Usha Raman wrote for *The Wire Science*, for its August 1 report on bioethics during the pandemic,

“B.R. Shamanna [– a public health expert and epidemiologist at the University of Hyderabad –] also warned of what has come to be called ‘vaccine nationalism’, falling into a competitive mindset that frames vaccine development as a “race” that will be “won” by the country that puts most resources into the game at the earliest stages.”

This said, a more raw form of nationalism has also been in evidence. For example, on July 2, ICMR director-general Balram Bhargava issued a controversial letter asking institutes participating in the clinical trials of a vaccine candidate developed by Bharat Biotech to conclude their tests, deliver the trial data *and manufacture the vaccine* by August 15, India’s Independence Day. As Vasudevan Mukunth, editor of *The Wire Science*, wrote then:

“Since a vaccine’s entry into the healthcare system depends on the results of [phase III] trials, researchers usually perform them with large cohorts of participants – typically in the thousands – and over many months, allowing themselves room to check for rare and/or delayed side-effects as well. This is why Dr Bhargava’s, and by proxy ICMR’s, decision to conduct human clinical trials as well as manufacture the vaccine in a span of five weeks on the assumption that the vaccine will work without any modifications raised questions about whether science is in command or politics.”

Shamanna himself told *The Wire Science* in Raman’s report, “Of course, in such a situation, decision-making has to be relatively quick, yet scientific integrity has to be maintained.”

Ultimately, as Gettleman wrote, “Mr Poonawalla said he felt an obligation to take this risk. ‘We just felt that this was our sort of moment,’ he said.”

<https://thewire.in/health/adar-poonawalla-serum-institute-covid-19-vaccine>

## BCG vaccine could slow down Covid-19 spread, says research but warns it's not a 'magic bullet'

*The BCG vaccine is usually given at the time of the birth of a child to prevent tuberculosis. The research says that the BCG vaccine helps develop immunity against various other infectious diseases*

*Edited By Amit Chaturvedi*

New Delhi: Scientists have found that the Bacillus Calmette-Guerin or BCG slows down the rate of infection and death of the coronavirus disease. The research says that the effect is very prominent in the first 30 days of the BCG vaccination.

The research comes as countries race to find a vaccine for Covid-19, which has devastated almost the entire globe.

The study, published in one of the journals of non-profit American Association for the Advancement of Science, says that the United States - the worst-affected country by Covid-19 - would not have such a high fatality rate if the government there had instituted mandatory BCG vaccination several decades ago.

The findings suggest that BCG vaccination policies can be effective in fight against Covid-19. The BCG vaccine is usually given at the time of the birth of a child to prevent tuberculosis. The research says that the BCG vaccine helps develop immunity against various other infectious diseases, perhaps including Covid-19.

The experts analysed daily rate of increase of confirmed cases in 135 countries and deaths in 134 countries in the first 30-day period of each country's outbreak. It was seen that "mandatory BCG vaccination correlated with a flattening of the curve in the spread of Covid-19".

However, the researchers did not portray the BCG vaccine as "magic bullet" against Covid-19, and said more analysis is needed.

There are nearly 100 vaccine candidates for Covid-19 which are at different stages of research and trials across the world. In India, Union health minister Harsh Vardhan announced on Saturday that 16 vaccine candidates are in different stages of development.

"The BCG vaccine is undergoing phase 3 trial, Zydus Cadila DNA vaccine is in phase I/II trial and 4 vaccine candidates are in advanced stages of pre-clinical study," he said.

Vardhan said that five good clinical laboratory practice clinical trial sites have been developed and six animal models for vaccine development studies are also ready.

The minister also announced the completion of pan-India 1000 genome sequencing of the SARS-CoV-2 virus.

<https://www.hindustantimes.com/india-news/bcg-vaccine-could-slow-down-covid-19-spread-says-research-but-warns-it-s-not-a-magic-bullet/story-kz8w51afZlOF11wirRHoLK.html>



A worker arranges BCG vaccine in a box, at Kings Institute in Chennai. (PTI File Photo)



## Russia preparing mass vaccination against coronavirus for October

*Russia's Health Minister Mikhail Murashko said the Gamaleya Institute, a state research facility in Moscow, had completed clinical trials of the vaccine and paperwork is being prepared to register it, Interfax news agency reported*

Moscow: Russia's health minister is preparing a mass vaccination campaign against the novel coronavirus for October, local news agencies reported on Saturday, after a vaccine completed clinical trials.

Health Minister Mikhail Murashko said the Gamaleya Institute, a state research facility in Moscow, had completed clinical trials of the vaccine and paperwork is being prepared to register it, Interfax news agency reported.

He said doctors and teachers would be the first to be vaccinated.

"We plan wider vaccinations for October," Murashko was quoted as saying.

A source told Reuters this week that Russia's first potential COVID-19 vaccine would secure local regulatory approval in August and be administered to health workers soon thereafter.

The Gamaleya Institute has been working on an adenovirus-based vaccine.

Yet the speed at which Russia is moving to roll it out has prompted some Western media to question whether Moscow is putting national prestige before science and safety.

The head of the Russian Direct Investment Fund, Kirill Dmitriev, has likened what he said was Russia's success in developing a vaccine to the Soviet Union's 1957 launch of Sputnik 1, the world's first satellite.

On Saturday, Russia reported 95 additional deaths from the novel coronavirus, taking its total to 14,058.

Officials reported 5,462 new cases, raising the total to 845,443.

More than 100 possible vaccines are being developed around the world to try to stop the Covid-19 pandemic.

At least four are in final Phase III human trials, according to World Health Organization (WHO) data, including three developed in China and another in Britain.

<https://www.indiatoday.in/world/story/russia-health-minster-preparing-mass-vaccination-coronavirus-october-1706824-2020-08-01>



The Gamaleya Institute has been working on an adenovirus-based vaccine. (Image for representation: Reuters)

## **Single dose of COVID-19 vaccine exhibits strong protection in pre-clinical studies**

*By Hina Zahid*

New Brunswick, N.J.- Johnson & Johnson (NYSE: JNJ) (the Company) today announced that its lead vaccine candidate protected against infection with SARS-CoV-2, the virus that causes COVID-19, in pre-clinical studies. The data, published in Nature, show the Company's investigational adenovirus serotype 26 (Ad26) vector-based vaccine elicited a robust immune response as demonstrated by "neutralizing antibodies," successfully preventing subsequent infection and providing complete or near-complete protection in the lungs from the virus in non-human primates (NHPs) in the pre-clinical study. Based on the strength of the data, a Phase 1/2a first-in-human clinical trial of the vaccine candidate, Ad26.COV2.S, in healthy volunteers, has now commenced in the United States and Belgium.

"We are excited to see these pre-clinical data because they show our SARS-CoV-2 vaccine candidate generated a strong antibody response and provided protection with a single dose. The findings give us confidence as we progress our vaccine development and upscale manufacturing in parallel, having initiated a Phase 1/2a trial in July with the intention to move into a Phase 3 trial in September," said Paul Stoffels, M.D., Vice Chairman of the Executive Committee and Chief Scientific Officer, Johnson & Johnson.

The robust Janssen COVID-19 clinical trial program, including the Phase 1/2a clinical trial and the Phase 3 clinical trial program, will evaluate both one- and two-dose regimens of Ad26.COV2.S in parallel studies. The Phase 1/2a trial will evaluate the safety, reactogenicity (expected reactions to vaccination, such as swelling or soreness), and immunogenicity of Ad26.COV2.S in over 1,000 healthy adults aged 18 to 55 years, as well as adults aged 65 years and older. Planning also is underway for a Phase 2a study in the Netherlands, Spain and Germany and a Phase 1 study in Japan. For more information about these studies, please visit [www.clinicaltrials.gov](http://www.clinicaltrials.gov).

As the Company plans its COVID-19 Phase 3 clinical development program, discussions are underway with partners with the objective to start a pivotal Phase 3 clinical trial of the single vaccine dose versus placebo in September, pending the interim data of the Phase 1 and 2 trials and approval of regulators. Simultaneously, the Company also is planning to start a parallel Phase 3 clinical trial of a two-dose regimen versus placebo.

The Company also will emphasize representation of populations that have been disproportionately impacted by the pandemic as it designs and implements its COVID-19 Phase 3 trial program. In the United States, this would include significant representation of Blacks, Hispanic/Latinx and participants over 65 years of age.

The pre-clinical studies were conducted by researchers from Beth Israel Deaconess Medical Center (BIDMC) in collaboration with the Janssen Pharmaceutical Companies of Johnson & Johnson and others as part of its ongoing collaboration to accelerate the development of a SARS-CoV-2 vaccine.

Dan Barouch, M.D., Ph.D., Director of the Center for Virology and Vaccine Research at BIDMC and the Ragon Institute, stated, "The pre-clinical data, generated in collaboration with the Johnson & Johnson team, highlights the potential of this SARS-CoV-2 vaccine candidate. Moreover, the data suggest that antibody levels may serve as a biomarker for vaccine-mediated protection."

In the studies, researchers first immunized the NHPs with a panel of vaccine prototypes, and then challenged them with SARS-CoV-2 infection. The scientists found that, of seven vaccine

prototypes tested in the study, Ad26.COVS.2 (referred to in the Nature article as Ad26-S.PP), elicited the highest levels of neutralizing antibodies to SARS-CoV-2. The level of antibodies correlated with the level of protection, confirming previous observations and suggesting they could be a potential biomarker for vaccine-mediated protection. The six NHPs that received a single immunization with Ad26.COVS.2 showed no detectable virus in the lower respiratory tract after exposure to SARS-CoV-2, and only one of six showed very low levels of the virus in a nasal swab at two time points.

"As we collectively battle this pandemic, we remain deeply committed to our goal of providing a safe and effective vaccine to the world. Our pre-clinical results give us reason to be optimistic as we initiate our first-in-human clinical trial, and we are excited to enter the next stage in our research and development toward a COVID-19 vaccine. We know that, if successful, this vaccine can be rapidly developed, produced on a large scale and delivered around the world," said Mathai Mammen, M.D., Ph.D., Global Head, Janssen Research & Development, LLC, Johnson & Johnson.

The Company's fundamental responsibility is to provide patients, consumers and healthcare providers with products that are as safe and effective as possible. Johnson & Johnson takes an evidence- and science-based, ethics- and values-driven approach to medical safety, putting patient and consumer wellbeing first and foremost in its decision making and actions, with an emphasis on transparency.

As Johnson & Johnson progresses the clinical development of SARS-CoV-2, the Company continues to increase manufacturing capacity and is in active discussions with global strategic partners to support worldwide access. Johnson & Johnson aims to meet its goal to supply more than one billion doses globally through the course of 2021, provided the vaccine is safe and effective.

This project has been funded in whole or in part with Federal funds from the Office of the Assistant Secretary for Preparedness and Response, Biomedical Advanced Research and Development Authority, under Other Transaction Agreement HHSO100201700018C.

<https://medicaldialogues.in/medicine/news/single-dose-of-covid-19-vaccine-exhibits-strong-protection-in-pre-clinical-studies-68232>

## Scientists figure out a weakness of coronavirus: Ordinary water

- *In a study, scientists discovered that about 90% of the Covid-19's particles die in room temperature water in the course of 24 hours*
- *Furthermore, scientists confirmed that boiling water containing Covid-19 kills it immediately and completely.*

As the race for a potential Covid-19 vaccine continues in order to curb the spread of the novel coronavirus pandemic, scientists have managed to find out an important weakness of the virus, according to a report.

Researchers from Russia's VECTOR State Research Center of Virology and Biotechnology in Novosibirsk, Siberia have figured out that ordinary water can help restrict the growth of the virus, according to Sputnik News report.

In their study, scientists discovered that about 90% of the virus' particles die in room temperature water in the course of 24 hours, with 99.9% succumbing within 72 hours. Furthermore, scientists confirmed that boiling water containing Covid-19 kills it immediately and completely.

Significantly, researchers also found that although the virus does not multiply in dechlorinated and sea water, it can remain viable for some time, with its lifespan depending directly on the water's temperature. Chlorinated water is also said to be highly effective at killing the virus, the report said.

The findings of the researchers were presented recently by Rospotrebnadzor, Russia's consumer protection and human wellbeing watchdog.

In the Covid-19 vaccine front, the country has been showing significant results in vaccine trials.

According to reports, Russian Health Minister Mikhail Murashko said Gamaleya Institute of Epidemiology and Microbiology, a state research facility in Moscow, had completed clinical trials of the Covid-19 vaccine and paperwork is being prepared to register it.

He also said that they are preparing a mass vaccination campaign against the novel coronavirus for October, said Reuters citing local news agencies' reports. Murashko added that the authorities are considering getting doctors and teachers vaccinated against the virus first, according to a report.

A source told Reuters this week that Russia's first potential Covid-19 vaccine would secure local regulatory approval in August and be administered to health workers soon thereafter.

Meanwhile, Russia registered 5,462 Covid-19 cases, bringing the cumulative total to 845,443, the country's coronavirus response centre said on Saturday.

The country reported 95 new deaths from the novel coronavirus on Saturday, pushing its national tally to 14,058. *With inputs from agencies*

<https://www.livemint.com/news/world/scientists-figure-out-a-weakness-of-coronavirus-ordinary-water-11596276025946.html>

## Can humans give coronavirus to bats, and other wildlife?

*Federal agencies suggest caution in U.S. bat research to avoid transmitting the novel coronavirus to wildlife*

*By James Gorman*

Many people worry about bats as a source of viruses, including the one that has caused a worldwide pandemic. But another question is surfacing: Could humans pass the novel coronavirus to wildlife, specifically North American bats?

It may seem like the last pandemic worry right now, far down the line after concerns about getting sick and staying employed. But as the spread of the novel coronavirus has made clear, the more careful we are about viruses passing among species, the better off we are.

The scientific consensus is that the virus originated in bats in China or neighboring countries. A recent paper tracing the genetic lineage of the novel virus found evidence that it probably evolved in bats into its current form. The researchers also concluded that either this coronavirus or others that could make the jump to humans are likely present in bat populations now — we just haven't found them yet.

So why worry about infecting new bats with the current virus? The federal government considers it a legitimate concern both for bat populations, which have been devastated by a fungal disease called white-nose syndrome, and for humans, given potential problems down the road.

The U.S. Geological Survey and the Fish and Wildlife Service, two agencies involved in research on bats, took the issue seriously enough to convene a panel of 12 experts to analyze the likelihood of human-to-bat transmission of the virus, SARS-CoV-2, in North America.

Another team of scientists, mostly from the two agencies, assessed the expert opinions and issued a report in June. They concluded that there is some risk, although how much is hard to pin down. Taking precautions, like wearing masks, gloves and protective clothing, could significantly cut it down.

Kevin Olival, a vice president for research at EcoHealth Alliance, an independent group and an author of the report, said that as the virus began to spread around the globe, “there was a real concern that not only North American but wildlife populations all over the world could be exposed.”

While the group studied interactions between North American bats and scientific researchers, Dr. Olival said wildlife-control workers and people who rehabilitate injured bats, for example, may come into contact with bats even more than researchers do.

Evaluating risk meant trying to cope with unknowns piled on unknowns: the risk of an infected research scientist or wildlife worker encountering bats; the risk of the bats becoming infected in that situation; the risk of an infected bat passing the virus onto other bats so that the virus becomes established in the population.

The authors of the paper concluded there was a risk of humans infecting bats with the novel coronavirus. How much risk? You might say little, or small, or unknown, but this report is from two federal agencies, so it describes the risk as “non-negligible.”



A Townsend's big-eared bat being collected for study and release in an abandoned mining cave near Ely, Nev. Credit...Kim Raff for The New York Times

Although the issue of how bat researchers should conduct their work may seem narrow, the potential consequences are broad. The report notes that if SARS-CoV-2 became established in North American bats, it would allow the virus to keep propagating in animals even if it didn't cause disease. And the virus could potentially spill back over to humans after this pandemic is contained.

Another concern involves how readily the coronavirus might spread from bats to other kinds of wildlife or domestic animals, including pets. Scientists have already shown that domestic cats and big cats can become infected, and domestic cats can infect each other. Ferrets are easily infected, as are minks. On the suspicion that they may be passing the disease to people, Spain and the Netherlands have slaughtered thousands of minks at fur farms.

A small number of infected pets has gotten a good deal of publicity. But public health authorities like the Centers for Disease Control and Prevention have said that, although information is limited, the risk of pets spreading the virus to people is low. They do recommend that any person who has Covid-19 take the same precautions with their pets that they would with human family members. National Geographic reported Thursday that the first U. S. dog known to have tested positive for SARS-CoV-2, had died. The dog, Buddy, apparently had lymphoma.

As to the susceptibility of North American bats, Dr. Olival was not aware of any published work on whether they can be infected with the virus. Researchers in Hong Kong have reported that in a lab the coronavirus infected the intestinal cells of Chinese rufous horseshoe bats. A report this month in *The Lancet* found that fruit bats could become infected with the virus.

Beyond bats, Dr. Olival said that scientists should be concerned about how they conduct research on wildlife in general and consider what precautions to take to avoid potentially infecting one species or another. One step, he said, would be evaluating research goals to weigh what level of contact would be necessary.

In some cases, he said, observation and data recording could be done without handling animals. If not, gloves and other precautions make sense, although some "old-school" researchers have balked at the suggestions, he said.

He said his group continues to recommend, "the highest level of personal protective equipment when you work with wildlife, because it's not just a risk that you will pick up something from the wildlife, but that you don't give something back to them."

He acknowledged that research precautions with wildlife will have a very small effect, given the greater number of people who hunt wildlife or come into contact in other ways. Education efforts are underway to try to change some of those practices; in addition that, he said, researchers "should set some kind of standard."

<https://www.nytimes.com/2020/08/01/science/Covid-bats.html>

## French researchers invent breath test to spot Covid-19 in the air

By Christina Okello

A hospital research team in the southern city of Lyon has come up with an instant breath test to tell whether someone has coronavirus or not. The discovery could pave the way for new coronavirus testing beyond throat and nose swabs.

It may be too early to say whether testing a person's breath for Covid-19 will be a game changer in France's efforts to tackle the pandemic, but for some researchers, it is a step in the right direction.

"We're pretty confident we're on the right track," Christian George, director of the National Centre of Scientific Research (CNRS) at the la Croix-Rousse hospital in Lyon told Reuters.

"Two months ago, we still knew very little about this disease, and now, we are starting to get information that is becoming clearer by the day," he noted.

That information is given out by a new breathalyser: a grey machine, the size of a refrigerator, that identifies chemical compounds in exhaled air.

The contraption is currently being tested on patients at the la Croix-Rousse hospital.

### Breath at last

Patients are required to blow into a tube and in a matter of seconds they are told if they have Covid-19 or not.

George and his team have tested dozens of people in three months, 20 of whom had the virus.

Unlike the uncomfortable standard PCR (polymerase chain reaction) tests, the new breathalyser is not invasive and provides an immediate result.

Some observers have said it is high time that attention was paid to the air we breathe, an important variable in what remains a respiratory pandemic.

There are still a few hurdles to get through before the breathalyser can be made available to the public.

### New era

First, is the cost. The current machine, which enters its second trial phase, is too expensive for widespread consumption experts say, and are relying on cheaper models further down the line.

Second, is its availability. The breathalyser is unlikely to be ready until the end of the year, too late if there is a second wave of the virus in France.

The other difficulty is being sure that the breathalyser tests specifically for Covid-19 and not every single respiratory disease.

"We remain cautious," said the CNRS' George, but insisted this new testing method could mark a "new era in medical diagnostics".

<https://www.rfi.fr/en/science-and-technology/20200802-french-researchers-invent-breath-test-spot-covid-19-air-we-breathe>



A researcher looks at a screen that is reading molecules detected by the COVID-19 test machine after a patient suffering from coronavirus disease (COVID-19) breathed into the tube at the La Croix-Rousse Hospital in Lyon, France, July 22, 2020. Picture taken July 22, 2020. © REUTERS - Yiming Woo

