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# 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

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**COVID 19: DRDO's Contribution**



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Government of India  
Ministry of Defence**

*Mon, 17 May 2021 2:44PM*

**Raksha Mantri Shri Rajnath Singh unveils first batch of anti-COVID drug developed by DRDO and hands over to Health Minister Dr Harsh Vardhan**

*2-DG medicine is a new ray of hope in fight against COVID-19, says Raksha Mantri*

*Terms the drug as a perfect example of country's scientific prowess & efforts towards self-reliance*

The first batch of the adjunct COVID therapy anti-COVID drug, 2-deoxy-D-glucose (2-DG), was released by Raksha Mantri Shri Rajnath Singh and handed over to Minister for Health & Family Welfare, Science & Tech and Earth Sciences Dr Harsh Vardhan in New Delhi on May 17, 2021. One box each of the sachets of the drug were handed over to Director, All India Institute of Medical Sciences (AIIMS) Dr. Randeep Guleria and Lt Gen Sunil Kant of Armed Forces Medical



Services (AFMS). More will be handed over to different hospitals across the country for emergency use. An anti-COVID-19 therapeutic application of the drug 2-deoxy-D-glucose (2-DG) has been developed by Institute of Nuclear Medicine and Allied Sciences (INMAS), a lab of Defence Research and Development Organisation (DRDO), along with Dr Reddy's Laboratories (DRL), Hyderabad.

Speaking on the occasion, the Raksha Mantri congratulated DRDO and DRL, Hyderabad for manufacturing the drug that will help the COVID patients to reduce oxygen dependency and recover quickly. He described the drug as a perfect example of the country's scientific prowess and a milestone in the efforts towards self-reliance. "2-DG drug is a new ray of hope in these challenging times," said Shri Rajnath Singh, expressing confidence that the medicine will play a crucial role in winning the fight against COVID-19. He said, the development and production of the drug is a shining example of public-private sector partnership to help the nation in these challenging times. He further said when the situation improves, he would personally like to honour the scientists who played a major role in the development of the drug as they deserve credit for this achievement.

Shri Rajnath Singh asserted that the Government is continuously monitoring the situation and taken effective steps to meet the requirement of oxygen supply, medicines & ICU beds in hospitals across the country through collective efforts of concerned Ministries/departments under the leadership of Prime Minister Shri Narendra Modi. He pointed out that the oxygen supply in the country has been substantially increased to more than 9,500 Metric Tonnes (MT) per day from around 4,700MT at the start of May.

The Raksha Mantri commended DRDO for setting up medical oxygen plants at various hospitals across the country under PM Cares Fund, besides constructing Covid hospitals, with ICU, oxygen and ventilators, in Delhi, Ahmedabad, Lucknow, Varanasi and Gandhinagar. Work is in progress to set up similar hospitals in Haldwani, Rishikesh, Jammu and Srinagar. He also appreciated the passion of retired AFMS doctors who have answered the nation's call and joined the medical fraternity in providing medical care to the needy.

Shri Rajnath Singh underlined the important role being played by the Armed Forces in assisting the civil administration to tide over the current situation. He said, the Indian Air Force (IAF) and Indian Navy (IN) are working tirelessly to transport oxygen tankers, containers, concentrators and other critical medical equipment from within the country and abroad. He also highlighted the expansion of treatment facilities at military hospitals which are now being provided to civilians as well.

The Raksha Mantri reiterated the Government's resolve to provide medical care to each and every citizen of the country, saying that Prime Minister has directed officials to conduct door-to-door testing, equip ASHA & Anganwadi workers with all necessary tools and provide all facilities in remote areas. He urged all stakeholders to walk shoulder to shoulder in the country's ongoing fight against the pandemic, expressing confidence that the country will emerge victorious against this invisible enemy. "We will not be at



ease. We will not be tired. We will keep fighting and win against COVID-19,” he emphasized stressed.

Shri Rajnath Singh also referred to the preparedness of the Armed Forces, saying that while they are providing support to the civil administration in fighting the second COVID-19 wave, they have not let their guard down.

In his address, Health Minister Dr Harsh Vardhan termed 2-DG as an important development by DRDO and DRL, Hyderabad that will reduce the recovery time & oxygen dependency in COVID-19 patients. He hoped that the drug will go a long way in defeating the virus in not just India but across the globe. He congratulated DRDO and its Scientists for playing an important role in the fight against COVID-19.

Secretary Department of Defence R&D and Chairman DRDO Dr G Satheesh Reddy expressed confidence that the anti-COVID drug will help the patients recover from the deadly virus, hoping that DRL, Hyderabad will take it forward and soon make the drug available for the patients. He also thanked Raksha Mantri for his continuous guidance and support.

Joining the event virtually, Chairman, DRL Shri Kallam Satish Reddy said, “Dr. Reddy’s is glad to have partnered with DRDO and INMAS in the development of 2-DG. This is a re-affirmation of our company’s efforts to address COVID through a host of therapeutics and vaccine.”

Secretary (Health & Family Welfare) Dr Rajesh Bhushan and DG Health Services Dr Sunil Kumar were also among the dignitaries who attended the event. Besides Chairman, DRL, Director, Centre for Cellular and Molecular Biology Dr Rakesh Mishra and many doctors, hospitals & labs across the country joined the event virtually.

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पत्र सूचना कार्यालय  
भारत सरकार

रक्षा मंत्रालय

Mon, 17 May 2021 2:44PM

## रक्षा मंत्री श्री राजनाथ सिंह ने डीआरडीओ द्वारा विकसित कोविड - प्रतिरोधी दवा की पहली खेप लॉन्च की और स्वास्थ्य मंत्री डॉ. हर्षवर्धन को सौंपी

*कोविड-19 के खिलाफ लड़ाई में 2-डीजी दवा आशा की एक नई किरण: रक्षा मंत्री*

*उन्होंने इस दवा को देश के वैज्ञानिक कौशल और आत्मनिर्भरता के प्रयासों का एक आदर्श उदाहरण बताया*

रक्षा मंत्री श्री राजनाथ सिंह द्वारा 17 मई, 2021 को नई दिल्ली में कोविड के लिये सहायक थेरेपी कोविड-प्रतिरोधी दवा, 2-डीऑक्सी-डी-ग्लूकोज (2-डीजी) का पहला बैच जारी किया और उसे स्वास्थ्य एवं परिवार कल्याण, विज्ञान एवं प्रौद्योगिकी और पृथ्वी विज्ञान मंत्री डॉ. हर्षवर्धन को सौंपा। इस दवा के पाउचों से भरा एक-एक डिब्बा अखिल भारतीय आयुर्विज्ञान संस्थान (एम्स) के निदेशक डॉ. रणदीप गुलेरिया और सशस्त्र बल चिकित्सा सेवा (एएफएमएस) के लेफ्टिनेंट जनरल सुनील कांत को भी सौंपा गया। इस दवा के और डिब्बे देशभर के विभिन्न अस्पतालों को आपातकालीन उपयोग के लिए सौंपे जायेंगे। इंस्टीट्यूट

ऑफ न्यूक्लियर मेडिसिन एंड एलाइड साइंसेज (इनमास), जोकि रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) की एक प्रयोगशाला है, द्वारा डॉ. रेड्डीज लेबोरेटरीज (डीआरएल), हैदराबाद के साथ मिलकर कोविड19 - प्रतिरोधी दवा 2-डीऑक्सी-डी-ग्लूकोज (2-डीजी) का एक चिकित्सीय अनुप्रयोग विकसित किया गया है।



इस अवसर पर बोलते हुए, रक्षा मंत्री ने डीआरडीओ और डीआरएल, हैदराबाद को इस दवा के विकास के लिए बधाई दी जो कोविड रोगियों की ऑक्सीजन पर निर्भरता कम करने और उन्हें जल्दी ठीक होने में मदद करेगी। उन्होंने इस दवा को देश के वैज्ञानिक कौशल का एक आदर्श उदाहरण और आत्मनिर्भरता की दिशा में एक मील का पत्थर बताया। श्री राजनाथ सिंह ने कहा कि “2-डीजी दवा इस चुनौतीपूर्ण समय में आशा की एक नई किरण है।” उन्होंने विश्वास व्यक्त किया कि यह दवा कोविड-19 के खिलाफ लड़ाई जीतने में महत्वपूर्ण भूमिका निभाएगी। उन्होंने कहा कि इस चुनौतीपूर्ण समय में देश की मदद करने के लिए इस दवा का विकास और उत्पादन सार्वजनिक-निजी क्षेत्र की साझेदारी का एक शानदार उदाहरण है। उन्होंने आगे कहा कि जब स्थितियां सुधारेगी, तो वे व्यक्तिगत रूप से इस दवा के विकास में प्रमुख भूमिका निभाने वाले सभी वैज्ञानिकों को सम्मानित करना चाहेंगे क्योंकि वे इस उपलब्धि के लिए श्रेय के पात्र हैं।

श्री राजनाथ सिंह ने जोर देकर कहा कि प्रधानमंत्री श्री नरेन्द्र मोदी के नेतृत्व में सरकार लगातार स्थिति की निगरानी कर रही है और संबंधित मंत्रालयों/विभागों के सामूहिक प्रयासों के माध्यम से देशभर के अस्पतालों में ऑक्सीजन की आपूर्ति, दवाओं और आईसीयू बेड की जरूरतों को पूरा करने के लिए कारगर कदम उठाए हैं। उन्होंने बताया कि देश में ऑक्सीजन की आपूर्ति मई की शुरुआत में लगभग 4,700 मीट्रिक टन से बढ़कर 9,500 मीट्रिक टन (एमटी) प्रतिदिन की हो गई है।

रक्षा मंत्री ने दिल्ली, अहमदाबाद, लखनऊ, वाराणसी और गांधीनगर में आईसीयू, ऑक्सीजन और वेंटिलेटर से लैस कोविड अस्पतालों के निर्माण के अलावा, पीएम केयर्स फंड के तहत देशभर के विभिन्न अस्पतालों में मेडिकल ऑक्सीजन संयंत्र स्थापित करने के लिए डीआरडीओ की सलाहना की। हल्द्वानी, ऋषिकेश, जम्मू और श्रीनगर में इसी तरह के अस्पताल स्थापित करने का काम जारी है। उन्होंने एएफएमएस के सेवानिवृत्त डॉक्टरों के जुनून की भी सलाहना की, जिन्होंने देश की पुकार पर जरूरतमंदों को चिकित्सीय देखभाल प्रदान करने में चिकित्सा बिरादरी के साथ हाथ बंटया है।

श्री राजनाथ सिंह ने वर्तमान स्थिति से निपटने में नागरिक प्रशासन की सहायता करने में सशस्त्र बलों द्वारा निभाई जा रही महत्वपूर्ण भूमिका को रेखांकित किया। उन्होंने कहा कि भारतीय वायु सेना (आईएएफ) और भारतीय नौसेना (आईएन) देश और विदेश से ऑक्सीजन टैंकर, कंटेनर, कंसन्ट्रेटर और अन्य महत्वपूर्ण चिकित्सा उपकरणों के परिवहन के लिए अथक प्रयास कर रहे हैं। उन्होंने सैन्य अस्पतालों में उपचार सुविधाओं के विस्तार पर भी प्रकाश डाला, जिन्हें अब आम नागरिकों को भी उपलब्ध कराया जा रहा है।

रक्षा मंत्री ने देश के प्रत्येक नागरिक को चिकित्सीय देखभाल प्रदान करने के सरकार के संकल्प को दोहराते हुए कहा कि प्रधानमंत्री ने अधिकारियों को घर-घर परीक्षण करने, आशा और आंगनवाड़ी कार्यकर्ताओं को सभी आवश्यक उपकरणों से लैस करने और दूरदराज के इलाकों में सभी सुविधाएं प्रदान करने का निर्देश दिया है। उन्होंने

सभी हितधारकों से इस महामारी के खिलाफ चल रही देश की लड़ाई में कंधे से कंधा मिलाकर चलने का आग्रह किया। उन्होंने विश्वास व्यक्त करते हुए कहा कि देश इस अदृश्य दुश्मन के खिलाफ विजयी होगा। उन्होंने जोर देकर कहा कि "हम चेन से नहीं बैठेंगे। हम थकेंगे नहीं। हम लड़ते रहेंगे और कोविड-19 के खिलाफ जीतेंगे।"

श्री राजनाथ सिंह ने सशस्त्र बलों की तैयारियों का भी उल्लेख करते हुए कहा कि अभी जब वे कोविड-19 की दूसरी लहर से लड़ने में नागरिक प्रशासन को सहायता प्रदान कर रहे हैं, तब भी उन्होंने अपनी सतर्कता में कोई कमी नहीं होने दी है।

अपने संबोधन में, स्वास्थ्य मंत्री डॉ. हर्षवर्धन ने 2-डीजी को डीआरडीओ और डीआरएल, हैदराबाद की एक महत्वपूर्ण उपलब्धि करार दिया, जो कोविड-19 के रोगियों को इस बीमारी से जल्दी से उबरने में मदद करेगा और ऑक्सीजन पर उनकी निर्भरता को कम करेगा। उन्होंने उम्मीद जताई कि यह दवा न केवल भारत में बल्कि दुनियाभर में इस वायरस को हराने में काफी मददगार साबित होगी। उन्होंने डीआरडीओ और उसके वैज्ञानिकों को कोविड-19 के खिलाफ लड़ाई में महत्वपूर्ण भूमिका निभाने के लिए बधाई दी।

रक्षा अनुसंधान एवं विकास विभाग के सचिव और डीआरडीओ के अध्यक्ष डॉ. जी सतीश रेड्डी ने विश्वास व्यक्त किया कि यह कोविड - प्रतिरोधी दवा रोगियों को घातक वायरस से उबरने में मदद करेगी। उम्मीद



है कि डीआरएल, हैदराबाद इस प्रक्रिया को आगे बढ़ाएगा और जल्द ही रोगियों को यह दवा उपलब्ध कराएगा। उन्होंने निरंतर मार्गदर्शन और समर्थन के लिए रक्षा मंत्री का धन्यवाद भी किया।

वर्चुअल रूप से इस कार्यक्रम में शामिल होते हुए डीआरएल के अध्यक्ष श्री कल्लम सतीश रेड्डी ने कहा कि उन्हें 2-डीजी के विकास में डीआरडीओ और इनमास के साथ भागीदारी करने की खुशी है। उन्होंने कहा कि चिकित्सीय और टीके के माध्यम से कोविड के खिलाफ हमारे महत्वपूर्ण प्रयासों की पुनः पुष्टि है।

इस कार्यक्रम में भाग लेने वाले गणमान्य व्यक्तियों में सचिव (स्वास्थ्य एवं परिवार कल्याण) डॉ. राजेश भूषण और स्वास्थ्य सेवाओं के महानिदेशक डॉ. सुनील कुमार भी शामिल थे। डीआरएल के अध्यक्ष के अलावा, सेल्युलर एंड मॉलिक्यूलर बायोलॉजी सेंटर के निदेशक डॉ. राकेश मिश्र और देशभर के कई डॉक्टर, अस्पताल और प्रयोगशालाओं से जुड़े लोग वर्चुअल रूप से इस कार्यक्रम में शामिल हुए।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1719363>



**Press Information Bureau**  
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**Ministry of Defence**

*Mon, 17 May 2021 5:36PM*

## **Raksha Mantri Shri Rajnath Singh reviews efforts of MoD, Armed Forces, DRDO & other Defence organisations in fighting second COVID-19 wave**

*Reviews logistic support to bolster medical oxygen supply and health infrastructure in states*

Raksha Mantri Shri Rajnath Singh reviewed the efforts of Ministry of Defence (MoD), the three services, Defence Research and Development Organisation (DRDO) and other Defence organisations in assisting the civil administration to tackle the current Covid-19 situation in the country, through a video conference on May 17, 2021. The meeting was attended by Chief of Defence Staff General Bipin Rawat, Defence Secretary Dr Ajay Kumar, Chief of Naval Staff Admiral Karambir Singh, Chief of Air Staff Air Chief Marshal R K S Bhadauria, Chief of Army Staff General M M Naravane, Secretary Department of Defence R&D and Chairman DRDO Dr G Satheesh Reddy, Additional Secretary (Defence Production) Shri Sanjay Jaju, ADG Armed Forces Medical Services (AFMS) and other senior officials of MoD.

The meeting focused on special covid hospitals being set up by DRDO in different states, creation of additional hospital beds in military hospitals, supply of Pressure Swing Adsorption (PSA) oxygen plants under PM CARES Fund and augmentation of doctors and other health professionals to meet the current demand. DRDO Chairman Dr G Satheesh Reddy briefed that the hospitals set up at Delhi, Lucknow, Varanasi, Ahmedabad and Patna were functional and providing services in treating the covid patients. Similar facilities are being established in Rishikesh and Haldwani in Uttarakhand and Jammu and Srinagar at the request of the concerned local/State/UT authorities.

The DRDO has completed establishment of five PSA oxygen plants (four in Delhi and one in Haryana) and work is in progress to set up 150-175 more such plants by the end of this month.

Chief of Defence Staff General Bipin Rawat acclaimed the excellent coordination among the three Services in providing assistance to the civilian administration whether in terms of logistic support or creation of additional health infrastructure. He added that the Army has set up health facilities in far-flung and remote areas to aid the local civil administration.



Chief of the Army Staff General Manoj Mukund Naravane assured that there is no let up in the Army's efforts in the war against COVID-19. He briefed the Raksha Mantri that military hospitals at identified locations have set aside beds for treatment of civilian COVID patients. Capabilities at the Base Hospital in New Delhi are also being ramped up. Additional oxygen plants, cylinders and concentrators are being procured to bolster the medical infrastructure and oxygen supply at these hospitals.

Chief of the Naval Staff Admiral Karambir Singh briefed Shri Rajnath Singh regarding the logistic support being provided by the Indian Naval Ships in transporting medical oxygen containers and other health equipment from abroad. He also mentioned the special health facilities created in various places by the Indian Navy to cater to the treatment for civilian COVID patients.

Chief of the Air Staff Air Chief Marshal RKS Bhadauria said Indian Air Force (IAF) has completed 990 sorties both within the country and abroad in various missions to transport oxygen containers and other health equipment.

Defence Secretary Dr Ajay Kumar commended the assistance provided by the three Services and added that nearly 800 doctors have been mobilised through various measures to meet the shortage of health professionals.

Defence Public Sector Undertakings (PSUs) also pitched in with Hindustan Aeronautics Limited (HAL) setting up a 250-bed hospital each in Lucknow and Bengaluru. Similarly, PSUs are also engaged in setting up oxygen plants by using Corporate Social Responsibility (CSR) funds.

Raksha Mantri praised the contribution of DRDO in developing the 2-DG medicine for the treatment of COVID patients. He added that currently the Covid-19 cases are reducing but all were required to remain alert. He directed the three Services and other organisations of MoD to continue with their regular work despite Covid-19 challenges.

This is the fourth review meeting held by Raksha Mantri since April 20, 2021 on the assistance extended by MoD and other Defence organisations in the fight against second COVID-19 wave. The first three meetings were held on 20<sup>th</sup> April, 24<sup>th</sup> April and 1<sup>st</sup> May.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1719357>

## New anti-covid drug "Should work against various strains": DRDO Chief

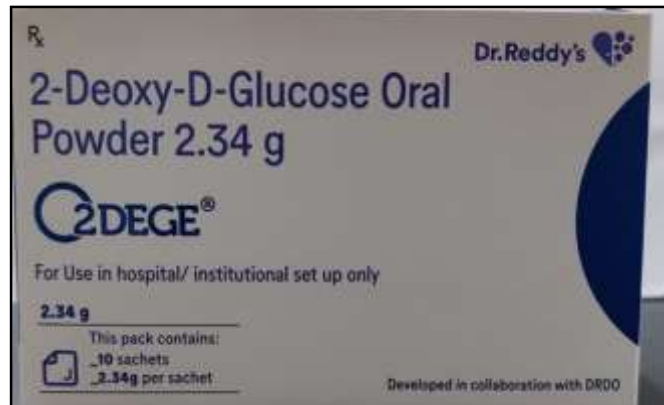
*The Defence Research and Development Organisation aims to ramp up production of anti-COVID drug 2-DG up to one lakh sachet per day by the first week of June*

New Delhi: The Defence Research and Development Organisation's (DRDO) new anti-COVID drug 2-DG should work against various strains of the COVID-19 virus, DRDO Chairperson Dr G Satheesh Reddy said today.

"The drug 2DG developed by us should work against the various strains of the COVID-19 virus," Dr Reddy said.

He added that the organisation was hoping to ramp up production of the drug up to one lakh sachet per day by the first week of June.

"From the first week of June, we are hoping to ramp up the production of the drug as the process to develop it takes around one month. We are hoping to increase the number of sachets production to one lakh per day," Dr Reddy said.



The first batch of anti-COVID drug 2-DG was released today.

The first batch of anti-COVID drug was released by Defence Minister Rajnath Singh and union health minister Harsh Vardhan today.

Earlier, the Chairperson had informed that the first batch of anti-COVID drug would only be available only to AIIMS, Armed Forces Hospitals, DRDO hospitals and other places in need. It will be made available to other hospitals in June.

India on Monday reported 2,81,386 new COVID-19 cases, 3,78,741 discharges and 4,106 deaths in the last 24 hours, as per Union Health Ministry.

The total cases in the country stand at 2,49,65,463, including 2,11,74,076 recoveries and 2,74,390 reported deaths. There are currently 35,16,997 active cases.

<https://www.ndtv.com/india-news/new-anti-covid-drug-should-work-against-various-strains-drdo-chairperson-2443516>

## Govt. releases DRDO's COVID drug for emergency use

*Developed with DRL, it reduces oxygen-dependence in patients*

New Delhi: The first batch of the adjunct COVID therapy drug, 2-deoxy-D-glucose (2-DG) — developed by the Defence Research and Development Organisation (DRDO) along with Dr Reddy's Laboratories (DRL), Hyderabad — was on Monday released for emergency use. Defence Minister Rajnath Singh formally handed over the drug to Health Minister Dr Harsh Vardhan.

“One box each of the sachets of the drug were handed over to Dr. Randeep Guleria, Director All India Institute of Medical Sciences (AIIMS) and Lt. Gen. Sunil Kant of Armed Forces Medical Services (AFMS). More will be handed over to different hospitals across the country for emergency use,” a Defence Ministry statement said.

An anti-COVID-19 therapeutic application of the drug 2-DG has been developed by Institute of Nuclear Medicine and Allied Sciences (INMAS), a DRDO lab along with DRL.

DRL will increase the production of the drug which is expected to be made available to all hospitals by the first week of June, said K. Satish Reddy, Chairman DRL.

The drug is a good example of DRDO and private partnership, which will help patients in overcoming oxygen dependency by around 40%, Mr. Singh said, speaking at the event. Dr. Harsh Vardhan said 2-DG was the first therapeutic drug for COVID which India has developed indigenously.

Clinical trial results have shown that this molecule helps in faster recovery of hospitalised patients and reduces supplemental oxygen dependence, DRDO has said earlier adding, “Higher proportion of patients treated with 2-DG showed RT-PCR negative conversion in COVID patients.”

“Scientists have been working on the molecule for long and over the last one year clinical trials were conducted extensively in various hospitals across the country,” said Dr. G. Satheesh Reddy, Chairman DRDO.

On May 1, the Drugs Controller General of India (DCGI) granted permission for emergency use of this drug as adjunct therapy in moderate to severe COVID-19 patients, the DRDO announced last week.

Phase-II clinical trial of 2-DG in COVID-19 patients was approved by DCGI in May 2020 and Phase-III clinical trials were permitted in November 2020. The Phase-III clinical trial was conducted on 220 patients between December 2020 to March 2021 at 27 COVID hospitals in Delhi, Uttar Pradesh, West Bengal, Gujarat, Rajasthan, Maharashtra, Andhra Pradesh, Telangana, Karnataka and Tamil Nadu, DRDO had stated.

<https://www.thehindu.com/news/national/govt-releases-drds-covid-drug-for-emergency-use/article34579529.ece>



Defence Minister Rajnath Singh hands over the first batch of 2-DG anti Covid drug to the Union Health Minister Harsh Vardhan, in New Delhi on May 17, 2021. Photo: Twitter/@rajnathsingh

## कोविड मरीजों की दवा 2 DG जारी, रक्षा मंत्री

### राजनाथ सिंह ने बताया- 'उम्मीद की किरण'

कोरोना संक्रमित मरीजों के लिए रक्षा अनुसंधान व विकास संगठन (DRDO) की नई दवा 2 DG (2-deoxy-D-glucose) की पहली खेप के तहत 10 हजार सैशे रक्षामंत्री राजनाथ सिंह व केंद्रीय स्वास्थ्य मंत्री हर्षवर्धन ने आज लॉन्च किया है।

By Monika Minal

नई दिल्ली: कोरोना संक्रमित मरीजों के लिए रक्षा अनुसंधान व विकास संगठन (DRDO) की नई दवा 2 DG (2-deoxy-D-glucose) की पहली खेप के तहत 10 हजार डोज सोमवार को रक्षामंत्री राजनाथ सिंह (Defence Minister Rajnath Singh) व केंद्रीय स्वास्थ्य मंत्री हर्षवर्धन ने लॉन्च किया। तीन ट्रायल के बाद 1 मई 2021 को DCGI की ओर से इसके आपातकाल उपयोग की अनुमति मिल गई। पाउडर के रूप में इस ड्रग को एक सैशे (sachet) में दिया जाएगा जो पानी में घोलकर लेना होगा। यह संक्रमित कोशिकाओं पर जाकर वायरस की वृद्धि को रोकने में सक्षम है।



5-7 दिन लेनी होगी दो डोज, DRDO प्रमुख ने दी जानकारी DRDO प्रमुख जी. सतीश रेड्डी ने इस दवा को लेने की प्रक्रिया बताई। उन्होंने कहा, 'यह दवा कोरोना वायरस से संक्रमित कोशिकाओं पर सीधा काम करेगी। शरीर का इम्यून सिस्टम काम करेगा और मरीज जल्दी ठीक होगा। इसे मरीज के वजन और डॉक्टर के प्रिसक्रिप्शन के आधार पर कम से कम 5-7 दिन सुबह-शाम 2 डोज लेनी है।' उन्होंने यह भी बताया कि अभी सप्ताह में 10,000 के आस पास कुल उत्पादन होगा। आज AIIMS, AFMS और DRDO अस्पतालों में दे रहे हैं। बाकी राज्यों को अगले चरण में देंगे। अभी थोड़ी देरी है। जून के पहले हफ्ते से सभी जगहों पर 2DG दवा उपलब्ध होगी।

#### वैज्ञानिकों की सराहना

रिलीज के मौके पर रक्षा मंत्री ने ड्रग को उम्मीद की किरण बताया, उन्होंने कहा, 'अभी हमें निश्चित होने की जरूरत नहीं है और न ही थकने और थमने की जरूरत है क्योंकि यह wave दूसरी बार आई है, और आगे भी इस बारे में कुछ निश्चित नहीं है। हमें पूरी सतर्कता के साथ कदम आगे बढ़ाने होंगे।' रक्षा मंत्री ने कहा, 'इस दवा को तैयार करने में जिन वैज्ञानिकों की मुख्य भूमिका है, मैं उन्हें अपने हाथों से सम्मानित करना चाहूंगा। ये दवा आशा और उम्मीद की एक नई किरण लेकर आई है, ये दवा हमारे देश के वैज्ञानिकों की क्षमता की एक मिसाल है।' उन्होंने आगे कहा, 'ऑक्सीजन सप्लाई, दवा, आइसीयू बेड व क्रायोजेनिक टैंकरों की व्यवस्था को हमने काफी गंभीरता से लिया है। इसके लिए सामूहिक प्रयास किया गया जिसका रिजल्ट बेहतर है।'

रक्षा मंत्री ने कहा, 'अब तक हम रक्षा क्षेत्र में डीआरडीओ और प्राइवेट पार्टनरशिप की बात करते थे। आज हेल्थ के सेक्टर में भी डीआरडीओ और प्राइवेट सेक्टर की पार्टनरशिप का इतना अच्छा परिणाम देख कर मुझे वाकई बहुत खुशी हो रही है।'

रक्षा मंत्री ने दी दवा की जानकारी

इस नई दवा के लिए रक्षा मंत्री ने कहा, 'मुझे बताया गया कि DRDO के इस दवा से सामान्य उपचार की तुलना में ढाई दिन जल्दी ठीक हुए हैं। साथ ही ऑक्सीजन पर निर्भरता भी करीब 40 फीसद कम हो गई। पाउडर के तौर पर विकसित इस दवा का इस्तेमाल ORS घोल की तरह इसका बड़ी आसानी से किया जा सकेगा।' रक्षा मंत्री ने अपने संबोधन के अंत में सबसे मिलकर काम करने की अपील की। उन्होंने कहा, 'आप सभी लोगों के सम्मिलित प्रयासों से यह देश, बड़े से बड़े संकटों का सामना कर सकेगा, उसमें विजयी हो सकेगा, ऐसा मेरा पूरा विश्वास है।'

रक्षा मंत्री के कार्यालय की ओर से पोस्ट किए गए ट्वीट में इस बारे में जानकारी दी गई। बताया गया कि आज सुबह 10.30 बजे वीडियो कॉन्फ्रेंसिंग के जरिए रक्षा मंत्री की ओर से इस दवा की पहली खेप जारी की जाएगी। इस दवा को DRDO की न्युक्लियर मेडिसीन इंस्टीट्यूट एंड अलाइड साइंसेज (INMAS) ने डॉक्टर रेड्डी लैब के साथ मिलकर विकसित किया है।

डॉक्टर अनंत नारायण भट्ट समेत DRDO वैज्ञानिकों ने किया विकसित

गत शुक्रवार को DRDO अधिकारी की ओर से एएनआइ को इस बात की जानकारी दी गई थी कि अगले सप्ताह 2DG दवा की 1000 खुराक वाली पहली खेप जारी कर दी जाएगी और इसे कोविड मरीजों को दिया जा सकेगा। DRDO के अधिकारियों ने यह भी बताया, 'दवा निर्माता आगे इस्तेमाल के लिए उत्पादन की प्रक्रिया तेज करने पर काम कर रहे हैं। इस दवा को बनाने में डॉक्टर अनंत नारायण भट्ट (Dr Anant Narayan Bhatt) समेत DRDO वैज्ञानिकों का योगदान है।' इस दवा का क्लिनिकल ट्रायल किया गया जिसका परिणाम सकारात्मक रहा है। इस ट्रायल में पता चला कि अस्पताल में भर्ती मरीजों के तेजी से स्वस्थ होने में ये मॉलिक्यूल मदद करते हैं और अतिरिक्त ऑक्सीजन पर निर्भरता को कम करता है। महामारी के खिलाफ तैयारियों के लिए प्रधानमंत्री नरेंद्र मोदी के आग्रह पर DRDO ने इस दवा के विकास का फैसला लिया था।

6,11 और 27 अस्पतालों में हुई ट्रायल

महामारी की पहली लहर के दौरान अप्रैल 2020 में INMAS-DRDO वैज्ञानिकों ने मिलकर CCMB (Centre for Cellular and Molecular Biology), हैदराबाद की मदद से काम शुरू किया और तभी पता चला कि ये मॉलिक्यूल SARS-CoV-2 वायरस पर असरदार हैं और इसके वृद्धि को रोकने में सक्षम हैं। इन परिणामों के आधार पर DCGI ने मई, 2020 में इसके फेज 2 क्लिनिकल ट्रायल की अनुमति दे दी। दूसरे फेज का ट्रायल पिछले साल मई से अक्टूबर तक चला और इसमें काफी अच्छे रिजल्ट सामने आए। इस ट्रायल को दो हिस्सों में चलाया गया पहली बार में 6 अस्पताल दूसरी बार में देश के 11 अस्पतालों को कवर किया गया। इसमें 110 मरीजों को यह दवा दी गई और इसके असरदार परिणाम सामने आए। इसे देखते हुए DCGI ने तीसरे क्लिनिकल ट्रायल की भी अनुमति दे दी जो 220 मरीजों पर दिसंबर 2020 से मार्च 2021 तक 27 अस्पतालों में किया गया। ये अस्पताल दिल्ली, उत्तर प्रदेश, पश्चिम बंगाल, गुजरात, राजस्थान, महाराष्ट्र, आंध्र प्रदेश, तेलंगाना, कर्नाटक और तमिलनाडु के हैं।

<https://www.jagran.com/news/national-rajnath-singh-to-release-first-batch-of-drdo-2dg-medicine-for-treating-covid19-patients-today-21650928.html>

## **Explained:** How does 2-DG, DRDO's new oral drug for Covid-19, work?

*The national drug regulator, Drugs Controller General of India (DCGI), had cleared the formulation on May 1 for emergency use as an adjunct therapy in moderate to severe Covid-19 patients*

New Delhi: Defence Minister Rajnath Singh and Health Minister Dr Harsh Vardhan on Monday (May 17) released the first batch of the indigenously developed anti-Covid-19 drug, 2-deoxy-D-glucose or '2-DG'.

The national drug regulator, Drugs Controller General of India (DCGI), had cleared the formulation on May 1 for emergency use as an adjunct therapy in moderate to severe Covid-19 patients.

### **The formulation**

2-DG has been developed by the Institute of Nuclear Medicine and Allied Sciences (INMAS), New Delhi, a lab of the Defence Research and Development Organisation (DRDO), in collaboration with Hyderabad-based Pharma Company Dr Reddy's Laboratories (DRL), the Ministry of Defence had said in a release earlier this month.

### **How it works**

According to the government release, clinical trial data show that the molecule helps in faster recovery of patients hospitalised with Covid-19, and reduces their dependence on supplemental oxygen.

The drug accumulates in virus-infected cells, and prevents the growth of the virus by stopping viral synthesis and energy production. Its selective accumulation in virally-infected cells makes this drug unique, the release said.

"The drug will be of immense benefit to the people suffering from Covid-19," it said.

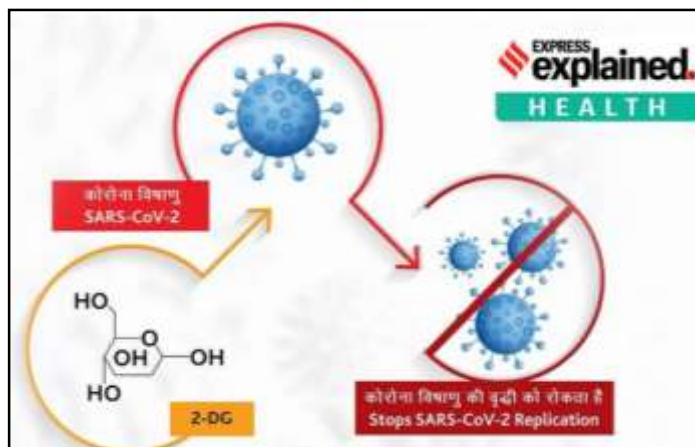
### **Clinical trials**

During the first wave of the pandemic in April 2020, laboratory experiments carried out by scientists of INMAS-DRDO in collaboration with the Centre for Cellular and Molecular Biology (CCMB), Hyderabad, found that this molecule works effectively against SARS-CoV-2, the coronavirus that causes the Covid-19 disease, and inhibits viral growth.

In May 2020, the Central Drugs Standard Control Organization (CDSCO) of the DCGI permitted phase 2 clinical trials of 2-DG in Covid-19 patients.

DRDO and its industry partner, DRL, conducted phase 2 trials on 110 patients between May and October last year, the government said. Phase 2a was conducted in six hospitals, and phase 2b (dose ranging) was conducted at 11 hospitals across the country.

On the basis of successful phase 2 clinical trials data, DCGI permitted phase 3 clinical trials in November 2020. Between December 2020 and March 2021, late stage trials were carried out on 220 patients admitted to 27 Covid hospitals in Delhi, Uttar Pradesh, West Bengal, Gujarat, Rajasthan, Maharashtra, Andhra Pradesh, Telangana, Karnataka and Tamil Nadu, the government said.



DCGI approves anti-COVID drug developed by DRDO for emergency use. (PTI Photo)

## Trial data

The phase 2 clinical trials were carried out to test the safety and efficacy of the drug in Covid-19 patients. 2-DG was found to be safe in Covid-19 patients, and showed significant improvement in their recovery, the government release said.

In efficacy trends, “the patients treated with 2-DG showed faster symptomatic cure than Standard of Care (SoC) on various endpoints”, the release said.

“A significantly favourable trend (2.5 days difference) was seen in terms of the median time to achieving normalisation of specific vital signs parameters when compared to SoC.”

Data from the phase 3 clinical trial showed that in the 2-DG arm, a “significantly higher proportion of patients improved symptomatically and became free from supplemental oxygen dependence (42% vs 31%) by Day 3 in comparison to SoC, indicating an early relief from oxygen therapy/dependence”, the government said.

A similar trend was observed in patients aged more than 65 years.

## Advantages

According to the government, 2-DG being a generic molecule and an analogue of glucose, it can be easily produced and made available in large quantities.

The drug is available in powder form in a sachet, and can be taken orally after dissolving in water.

<https://indianexpress.com/article/explained/drdo-new-oral-drug-2-dg-coronavirus-7318447/>

# THE TIMES OF INDIA

Tue, 18 May 2021

## DRDO's 2-DG anti-Covid drug: All you need to know

New Delhi: Defence Minister Rajnath Singh and Union Health Minister Dr Harsh Vardhan on Monday released the first batch of anti-COVID drug 2-deoxy-D-glucose (2-DG) developed by the Defence Research and Development Organisation (DRDO).

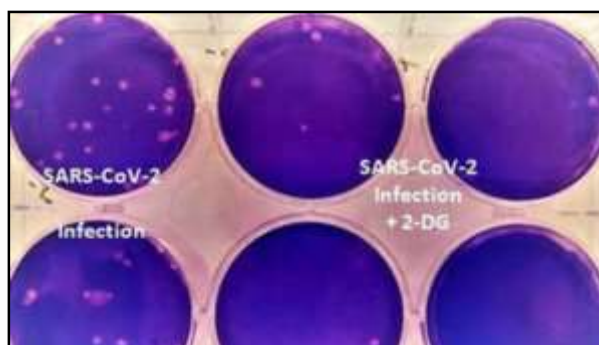
The anti-Covid therapeutic application of the drug has been developed by the Institute of Nuclear Medicine and Allied Sciences (INMAS), a leading laboratory of the DRDO, in collaboration with Dr Reddy's Laboratories (DRL) in Hyderabad.

Earlier this month, the Drugs Controller General of India (DCGI) has approved the oral drug for emergency use as an adjunct therapy in moderate to severe coronavirus patients. The approval of the drug has come at a time when India is grappling with a record-breaking wave of the coronavirus pandemic that has stretched the country's healthcare infrastructure to its limit.

DRDO chairman Dr G Satheesh Reddy said that DRDO and Dr Reddy's lab had gone through the complete trials and conducted trials across 30 hospitals and on a large number of patients.

The drug comes in powder form in a sachet, which is taken orally by dissolving it in water. It accumulates in the virus-infected cells and prevents virus growth by stopping viral synthesis and energy production. Its selective accumulation in virally infected cells makes this drug unique.

Clinical trial results have shown that this drug helps in faster recovery of hospitalised patients and reduces supplemental oxygen dependence. Higher proportion of patients treated with 2-DG showed RT-PCR negative conversion in Covid patients.



DCGI approves anti-COVID drug developed by DRDO for emergency use.

In April 2020, during the first wave of the pandemic, INMAS-DRDO scientists conducted laboratory experiments with the help of Centre for Cellular and Molecular Biology (CCMB), Hyderabad, and found that this molecule works effectively against SARS-CoV-2 virus and inhibits the viral growth.

It said based on these results, the Drugs Controller & Central Drugs Standard Control Organisation (CDSCO) permitted Phase-II clinical trial of 2-DG in Covid-19 patients in May 2020.

The DRDO, along with its industry partner DRL, Hyderabad, started the clinical trials to test the safety and efficacy of the drug in Covid-19 patients.

In Phase-II trials (including dose ranging) conducted during May-October 2020, the drug was found to be safe in Covid patients and showed significant improvement in their recovery, the ministry statement said adding, Phase-II was conducted in six hospitals and Phase IIb (dose ranging) clinical trial was conducted at 11 hospitals all over the country.

In efficacy trends, the patients treated with 2-DG showed faster symptomatic cure than Standard of Care (SoC) on various endpoints. A significantly favourable trend (2.5 days difference) was seen in terms of the median time to achieving normalisation of specific vital signs parameters when compared to SoC.

In November 2020, Phase-3 trials were approved and went on from December to April. On May 1, the drug was approved for emergency use. Dr Reddy's Labs is engaged in its production.

Based on successful results, DCGI further permitted the Phase-III clinical trials in November 2020. The Phase-III clinical trial was conducted on 220 patients between December 2020 to March 2021 at 27 Covid hospitals in Delhi, Uttar Pradesh, West Bengal, Gujarat, Rajasthan, Maharashtra, Andhra Pradesh, Telangana, Karnataka and Tamil Nadu. The detailed data of phase-III clinical trial was presented to DCGI. In 2-DG arm, significantly higher proportion of patients improved symptomatically and became free from supplemental oxygen dependence (42% vs 31%) by Day-3 in comparison to SoC, indicating an early relief from Oxygen therapy/dependence.

On May 01, 2021, DCGI granted permission for Emergency Use of this drug as adjunct therapy in moderate to severe Covid-19 patients.

<https://timesofindia.indiatimes.com/india/drdo-2-dg-anti-covid-drug-all-you-need-to-know/articleshow/82701791.cms>



## DRDO की एंटी कोविड दवा से घटेगा रिकवरी टाइम, कम होगी ऑक्सीजन पर निर्भरता: हर्षवर्धन

नई दिल्ली: केंद्रीय स्वास्थ्य मंत्री हर्षवर्धन ने सोमवार को कहा कि डीआरडीओ द्वारा विकसित कोविड-19 रोधी दवा 2-डीऑक्सी-डी-ग्लूकोज (2-डीजी) कोरोना संक्रमण के रिकवरी टाइम और ऑक्सीजन की निर्भरता को कम करने में मददगार साबित होगी।

इसे जारी करते वक्त स्वास्थ्य मंत्री ने कहा कि 'डीआरडीओ के सपोर्ट से और रक्षा मंत्री राजनाथ सिंह के नेतृत्व में एंटी कोविड दवा 2डीजी हमारी पहली स्वदेशी रिसर्च आधारित कोविड दवा होगी। यह रिकवरी टाइम और ऑक्सीजन पर निर्भरता को कम करेगी।'



बता दें कि रक्षा मंत्री राजनाथ सिंह और केंद्रीय स्वास्थ्य मंत्री हर्षवर्धन ने रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) की ओर से विकसित की गयी कोविड-19 रोधी दवा 2-डीजी की पहली खेप सोमवार को जारी की।

कोविड-19 के मध्यम लक्षण वाले तथा गंभीर लक्षण वाले मरीजों पर 2-डीऑक्सी-डी-ग्लूकोज (2-डीजी) दवा के आपातकालीन इस्तेमाल को भारत के औषधि महानियंत्रक (डीजीसीआई) की ओर से मंजूरी मिल चुकी है।

इस अवसर पर अपने संक्षिप्त संबोधन में राजनाथ सिंह ने कहा कि यह दवा कोविड-19 मरीजों के उपचार के लिए उम्मीद की किरण ले कर आई है। उन्होंने कहा, 'यह देश के वैज्ञानिक कौशल का अनुपम उदाहरण है।'

रक्षा मंत्री ने कहा कि यह समय थकने और आराम करने का नहीं है क्योंकि इस महामारी के स्वरूप को लेकर कुछ भी निश्चित जानकारी नहीं है।

डीआरडीओ की ओर से आयोजित इस कार्यक्रम में उन्होंने कहा, 'हमें न तो थकना है और न ही आराम करना है। क्योंकि यह लहर दूसरी बार आई है और इसे लेकर कुछ निश्चित जानकारी नहीं है। हमें बहुत सावधानी से कदम आगे बढ़ाना है।'

उन्होंने कहा कि चाहे ऑक्सीजन की आपूर्ति का मामला हो या आईसीयू बिस्तरों या तरल ऑक्सीजन के परिवहन के लिए क्रायोजेनिक टैंकों की उपलब्धता सुनिश्चित करने की बात हो, सरकार ने पूरी स्थिति को बेहद गंभीरता से लिया है।

रक्षा मंत्रालय ने आठ मई को एक बयान में कहा था कि 2-डीऑक्सी-डी-ग्लूकोज (2-डीजी) के क्लिनिकल परीक्षण में पता चला है कि इससे अस्पताल में भर्ती मरीजों की ऑक्सीजन पर निर्भरता को कम करने में मदद मिलती है। साथ ही इस दवा से मरीज जल्दी ठीक होते हैं।

इस दवा को ऐसे समय में मंजूरी मिली है जब भारत कोविड-19 महामारी की दूसरी लहर के चपेट में है और देश के स्वास्थ्य ढांचे पर इसका गहरा असर पड़ा है।

कोविड-19 रोधी इस दवा को डीआरडीओ की अग्रणी प्रयोगशाला नाभिकीय औषधि तथा संबद्ध विज्ञान संस्थान (इनमास) ने हैदराबाद के डॉक्टर रेड्डीज प्रयोगशाला के साथ मिलकर विकसित किया है।

यह दवा एक सैशे में पाउडर के रूप में उपलब्ध रहेगी जिसे पानी में मिलाकर मरीजों को पीना है।

<https://hindi.theprint.in/india/anti-covid-drug-by-drdo-2dg-will-reduce-recovery-time-and-oxygen-dependency-health-minister-harshvardhan-says/217103/>

## नवभारत टाइम्स

Tue, 18 May 2021

### 2DG Medicine Launch: शरीर में जाते ही करने लगेगी कोरोना पर वार, डोज, साइड इफेक्ट्स, कीमत.. इस दवा के बारे में सब कुछ जानिए

**DRDO 2DG Anti Covid Drug: कोरोना वायरस के सभी वेरिएंट्स के खिलाफ असरदार इस दवा को डिफेंस रिसर्च एंड डिवेलपमेंट ऑर्गनाइजेशन (डीआरडीओ) ने विकसित किया है।**

**यह शरीर में वायरस को बढ़ने से रोकती है।**

*By Deepak Verma*

भारत समेत दुनिया के अधिकांश हिस्से में कहर बनकर टूटे SARS-CoV-2 के लिए दवा आ चुकी है। 2-deoxy-D-glucose यानी 2डीजी नाम के इस एंटी-कोविड ड्रग को डीआरडीओ के वैज्ञानिकों ने बनाया है।

रक्षा मंत्री राजनाथ सिंह और स्वास्थ्य मंत्री हर्षवर्धन ने इस दवा का पहला बैच (10,000 डोज) लॉन्च किया।

हाइड्रॉक्सीक्लोरोक्विन, रेमडिसिविर, आइवरमेक्टिन जैसी तमाम दवाओं के कोविड-19 पर असर को लेकर पिछले साल से ही रिसर्च चलती रही, मगर 2DG वह पहली दवा है जिसे एंटी-कोविड ड्रग कहा जा रहा है। आइए इसके बारे में सबकुछ जानते हैं।



**2DG: किसने बनाया, कौन करेगा उत्पादन?**

- 2डीजी को डिफेंस रिसर्च एंड डिवेलपमेंट ऑर्गनाइजेशन (DRDO) के इंस्टिट्यूट ऑफ न्यूक्लियर मेडिसिन एंड अलाइड साइंसेज (INMAS) ने विकसित किया है। इसमें हैदराबाद स्थित डॉ. रेड्डीज लैबोरेटरी (DRL) के रिसर्चर्स का भी योगदान है। DRL ही आम जनता के लिए इस दवा को बनाएगी। यह दवा एक पाउडर के रूप में उपलब्ध होगी।
- पिछले साल जब भारत में कोविड-19 की पहली लहर की शुरुआत हुई थी, तभी से INMAS के वैज्ञानिकों ने इसपर काम शुरू कर दिया था। मई 2020 में ड्रग कंट्रोलर जनरल ऑफ इंडिया (DCGI) ने इस दवा के कोविड मरीजों पर फेज 2 ट्रायल की मंजूरी दे दी। यह ट्रायल अक्टूबर तक चले।
- ट्रायल में सामने आया कि दवा कोविड मरीजों के लिए सेफ है और रिकवरी में भी मदद करती है। नतीजों के बाद DCGI ने नवंबर 2020 में फेज 3 ट्रायल की मंजूरी दी। आखिरकार ट्रायल डेटा के आधार पर 9 मई 2021 को DCGI ने इस दवा के आपातकालीन इस्तेमाल को मंजूरी दे दी।

**2DG Medicine Launch: शरीर में जाते ही करने लगेगी कोरोना पर वार, डोज, साइड इफेक्ट्स, कीमत... इस दवा के बारे में सबकुछ जानिए**

कोविड-19 के खिलाफ कैसे काम करती है 2DG?

- 2डीजी असल में 2डीजी अणु का एक परिवर्तित रूप है जिससे ट्यूमर, कैंसर कोशिकाओं का इलाज होता है। ट्रायल में पता चला कि 2DG कोविड मरीजों के इलाज में तो कारगर है ही, हॉस्पिटल में एडमिट मरीजों की ऑक्सिजन पर निर्भरता को भी कम करती है।
- फिलहाल इस दवा को सेकेंडरी मेडिसिन की तरह यूज करने की परमिशन दी गई है। यानी यह प्राइमरी मेडिसिंस के सपोर्ट में यूज की जाएगी। यह दवा काफी हद तक ग्लूकोज जैसी है, मगर ग्लूकोज नहीं है। वायरस शरीर में पहुंचते ही अपनी कॉपीज बनाना शुरू कर देता है, इसके लिए उसे ताकत चाहिए होती है जो ग्लूकोज से मिलती है।
- जब यह दवा दी जाएगी तो वायरस इस ग्लूकोज एनालॉग को लेगा और उसी में फंस जाएगा। नतीजा ये होगा कि वायरस अपनी कॉपीज नहीं बना पाएगा यानी उसकी ग्रोथ रुक जाएगी।

क्या यह दवा कोविड-19 के हर वेरिएंट को रोकेगी?

INMAS के डायरेक्टर डॉ. अनिल मिश्रा के अनुसार, 2डीजी अपनी कॉपी बनाने वाले वायरस को कैद कर लेती है। यानी वायरस का कोई भी वेरिएंट हो, उसे खाने की जरूरत तो पड़ेगी ही और जैसे ही वह अपनी भूख मिटाने के लिए आगे बढ़ेगा, यह दवा उसे फंसा लेगी।

डॉ. मिश्रा के मुताबिक, यह दवा लेने के बाद ऑक्सिजन की डिमांड बढ़ जाती है क्योंकि वायरस तेजी से मल्टीप्लाई होने लगता है। एक बार वह प्रक्रिया रुक गई तो ऑक्सिजन का संकट भी खत्म हो जाएगा।

2DG: डोज क्या होगी? कीमत क्या रखी गई है?

INMAS के वैज्ञानिक डॉ. सुधीर चंदना के मुताबिक, यह दवा एक सैशे के रूप में उपलब्ध होगी। जैसे आप ORS को पानी में घोलकर पीते हैं, वैसे ही इसे भी पानी में मिलाकर ले सकेंगे। उन्होंने कहा कि यह दवा दिन में दो बार लेनी होगी। कोविड-19 मरीजों को पूरी तरह ठीक होने के लिए 5 से 7 दिन तक यह दवा देनी पड़ सकती है।

कीमत को लेकर अभी कुछ नहीं कहा गया है। डॉ. चंदना के अनुसार, इस बारे में कोई फैसला डॉ. रेड्डीज लैबोरेटरी ही करेगी। हालांकि उन्होंने यह जरूरी कहा कि दवा किफायती हो, इसका ध्यान रखा जाएगा। सूत्रों के मुताबिक, एक सैशे की कीमत 500 से 600 रुपये के बीच हो सकती है।

2DG दवा कब आएगी? क्या कोई साइड इफेक्ट्स भी हैं?

यह दवा 17 मई को लॉन्च होते ही आम जनता के लिए उपलब्ध हो गई है। इसका उत्पादन तेजी से बढ़ाया जा रहा है ताकि ज्यादा से ज्यादा मरीजों तक इसकी पहुंच हो सके।

साइड इफेक्ट्स के बारे में पूछने पर डॉ. चंदना ने कहा कि ट्रायल के दौरान, सामान्य और गंभीर मरीजों को यह दवा दी गई। सभी मरीजों को इस दवा से फायदा ही हुआ, किसी पर कोई प्रतिकूल प्रभाव देखने को नहीं मिला। उनके मुताबिक, यह कहा जा सकता है कि इस दवा का कोई साइड इफेक्ट नहीं है।

<https://navbharattimes.indiatimes.com/india/drdo-2dg-anti-covid-medicine-price-dosage-availability-all-you-need-to-know/articleshow/82697510.cms?story=1>

## DRDO's anti-Covid drug 2-DG to be available at hospitals from June

*DRL to manufacture oral drug, which reduces oxygen dependency in patients*

*By Ajai Shukla*

New Delhi: Defence Minister Rajnath Singh on Monday released the first batch of a keenly awaited anti-Covid-19 drug called 2-deoxy-D-glucose (2-DG). It has been developed by the Defence Research and Development Organisation (DRDO), in partnership with Hyderabad-based private firm Dr Reddy's Laboratories (DRL).

The new drug is not a vaccination, or a preventive measure against being infected by coronavirus. Rather, the 2-DG molecule hastens the recovery of patients who are already suffering from the disease and are, in most cases, facing severe oxygen dependency. The drug is dispensed in powder form in a sachet, and taken orally after being dissolved in water.

Rajnath Singh handed over the first batch of the drug in Delhi to the Minister for Health & Family Welfare, Science & Technology and Earth Sciences, Harsh Vardhan.

DRL Chairman Kallam Satish Reddy said his company would “increase the production capacity of the drug, which is expected to be made available to all hospitals by the first week of June,” stated a Ministry of Defence (MoD) release on Monday. Randeep Guleria, director at All India Institute of Medical Sciences (AIIMS), and Lt Gen Sunil Kant of Armed Forces Medical Services (AFMS) were also handed over a box of the drug each.

“More will be handed over to different hospitals across the country for emergency use,” the MoD said. The so-called “anti-Covid-19 therapeutic application”, which would help patients to reduce oxygen dependency and spend less time in hospital, has been developed by the DRDO laboratory, the Institute of Nuclear Medicine and Allied Sciences (INMAS).

Speaking at the release, the defence minister congratulated DRDO and Dr Reddy's Laboratory for manufacturing the drug. “2-DG drug is a new ray of hope in these challenging times,” he said.

Harsh Vardhan, speaking on the occasion, termed 2-DG an important development that would reduce the recovery time and oxygen dependency in Covid-19 patients. He hoped that the drug would defeat the virus, not just in India but across the globe. The Drugs Controller General of India had granted permission on May 1 for emergency use of this drug as “adjunct therapy in moderate to severe Covid-19 patients.”

Rajnath Singh said “the development and production of the drug is a shining example of public-private sector partnership in these challenging times.”

The defence minister further said that, when the situation improves, he would personally like to honour the scientists who played a major role in the development of the drug.

Rajnath Singh, who has overseen the military's vigorous response to the second wave of the Covid-19 pandemic, said the government had taken effective steps to provide oxygen, medicines and intensive care unit (ICU) beds in hospitals across the country.

He said country-wide oxygen supply had been substantially increased to more than 9,500 metric tonnes (mt) per day, from around 4,700 mt at the beginning of May.



Union Defence Minister Rajnath Singh hands over to Health Minister Harsh Vardhan the newly launched anti-Covid drug 2DG, developed by DRDO, on Monday. Photo: PTI

The defence minister commended the DRDO for setting up medical oxygen plants in hospitals across the country under the PM-CARES Fund. He also praised the DRDO for setting up Covid-19 hospitals, equipped with oxygen, ventilators and ICUs, in Delhi, Ahmedabad, Lucknow, Varanasi and Gandhinagar. Similar hospitals are being set up in Haldwani, Rishikesh, Jammu and Srinagar.

Rajnath Singh also appreciated the passion of retired armed forces doctors who responded to the MoD's call and re-joined service to provide medical care.

He praised the air force and the navy for working tirelessly to transport oxygen tankers, containers, concentrators and other critical medical equipment from abroad and within the country. He highlighted the expansion of Covid-19 treatment facilities at military hospitals which are now being availed by civilians as well.

The defence minister praised the operational orientation of the armed forces, which he said remained alert on the borders even while supporting the civil administration in fighting the second wave.

[https://www.business-standard.com/article/current-affairs/drdo-s-anti-covid-drug-2-dg-to-be-available-at-hospitals-from-june-121051800074\\_1.html](https://www.business-standard.com/article/current-affairs/drdo-s-anti-covid-drug-2-dg-to-be-available-at-hospitals-from-june-121051800074_1.html)

## THE TIMES OF INDIA

*Tue, 18 May 2021*

### **Govt places order for DRDO drug**

Jaipur: As the Government of India launched anti-Covid drug 2-deoxy-D-glucose (2-DG), developed by DRDO in collaboration with Dr Reddy's Lab, on Monday, the state-run agency Rajasthan Medical Services Corporation Limited (RMSCL) placed an order to purchase 10,000 sachets of the drugs from Dr Reddy's Lab, said an official.

The anti-Covid-19 therapeutic application of 2-DG has been developed by Institute of Nuclear Medicine and Allied Sciences (INMAS), a lab of DRDO, along with Dr Reddy's Laboratories (DRL), Hyderabad.

Meanwhile, the National Health Mission (NHM) has also floated an expression of interest (EOI) for the procurement of medical oxygen generation plants (mobile). EOI has been invited from private entities, government-owned entity/manufacturer/authorised dealer/suppliers for supply, testing and commissioning of mobile PSA oxygen generation plants through rate contract for a period of six months. Bidders have to submit their proposals at md-nhm-rj@gov.in by May 21.

Health minister Raghu Sharma had earlier written to Union health minister Harsh Vardhan and demanded 50,000 vials of liposomal amphotericin B for the state.

<https://timesofindia.indiatimes.com/city/jaipur/govt-places-order-for-drdo-drug/articleshow/82720330.cms>

## कोरोना के खिलाफ CM योगी का बड़ा फैसला, अधिकारियों को दिया 2DG दवा मंगाने का निर्देश

मुख्यमंत्री योगी आदित्यनाथ ने सभी अधिकारियों को निर्देश दिया है कि आज ही लांच हुई DRDO की 2DG दवाई प्रदेश के लोगों के लिए मंगाई जाए।

- DRDO की दवा 2DG को मंगाने के लिए अफसरों को निर्देश
- योगी आदित्यनाथ ने DRDO की तैयार दवा को लेकर दिया निर्देश

लखनऊ: उत्तरप्रदेश के मुख्यमंत्री योगी आदित्यनाथ लगातार कोरोना के खिलाफ कड़े और बड़े फैसले ले रहे हैं। उत्तरप्रदेश में इसके सकारात्मक परिणाम भी दिखने लगे हैं।

राज्य में कोरोना की दूसरी लहर कुछ मंद होती दिख रही है। यूपी में 17 तारीख से बढ़ाकर लॉकडाउन 24 तक कर दिया गया। इसके बाद अब 2DG दवाई के सम्बंध में योगी आदित्यनाथ ने शानदार निर्णय लिया।



सीएम योगी का DRDO की दवा 2DG को मंगाने के लिए अफसरों को निर्देश

मुख्यमंत्री योगी आदित्यनाथ ने सभी अधिकारियों को निर्देश दिया है कि आज ही लांच हुई DRDO की 2DG दवाई प्रदेश के लोगों के लिए मंगाई जाए।

रक्षामंत्री राजनाथ सिंह और स्वास्थ्य मंत्री डॉ हर्षवर्धन ने इस दवाई को जनता को सौंपा। DRDO का दावा है कि ये दवाई कोरोना से लड़ने में मरीज की मदद करेगी और उसे रिकवर करने में सहायक होगी।

सीएम योगी आदित्यनाथ ने DRDO की तैयार दवा को लेकर दिया निर्देश

सीएम योगी ने अफसरों को आदेश दिया है कि वे दवा की मांग पत्र केंद्र को भेजने की तैयारी करें ताकि केंद्र सरकार समय पर दवाई की पर्याप्त डोज उत्तरप्रदेश को भेज सके। केंद्र सरकार द्वारा DRDO की विकसित दवा 2DG को आपातकालीन प्रयोग की अनुमति मिली है।

देश की मोदी सरकार के स्तर से ही 2DG का वितरण होगी। यूपी में आपूर्ति सुनिश्चित करने के लिए अफसरों को मांग पत्र भेजने के निर्देश सीएम योगी ने दे दिया है।

थम रही कोरोना की रफ्तार

उत्तर प्रदेश में अब कोरोना वायरस की रिकवरी की दर लगभग 90 प्रतिशत हो गई है। इसके साथ ही 18 वर्ष से अधिक आयु वर्ग के लोगों के लिए आज से वैक्सीनेशन 23 जिलों में शुरू हो गया है। अपर मुख्य सचिव सूचना नवनीत सहगल ने बताया कि बीते 24 घंटे में प्रदेश में 9391 नए कोरोना संक्रमित लोग मिले हैं।

इसके विपरीत इसके कहर से उबरने वालों की संख्या 23445 थी। प्रदेश में बीते 24 घंटे में कोरोना वायरस के संक्रमण से 285 लोगों की मौत हुई है, रविवार को यह संख्या 311 थी।

<https://zeenews.india.com/hindi/zee-hindustan/national/cm-yogi-ordered-to-officer-for-anti-covid-2dg-medicine-up-government/902414>

## Director Health Services interacts with DRDO team

### *Hails role of engineers, executing agencies*

Director Health Services Kashmir Dr Mushtaq Ahmad Rather on Monday visited the site of the upcoming Covid-19 hospital at Khonmoh and interacted with a team of officers from DRDO and officers of various executing agencies.

A spokesperson of Directorate of Health Services Kashmir said that the director visited the upcoming Covid hospital which would be having 500 bed capacity and would be completed in the shortest period of time.

“Director Health service Kashmir interacted with a team of officers from DRDO and officers of various executing agencies while reviewing the status of a 500 bedded hospital which would be having 125 ICU beds. The Covid Care Hospital is under construction at Khonmoh Srinagar,” the spokesperson said.

He said that the hospital is expected to start functioning in the 1st week of June with the support of Directorate of Health Services Kashmir and DRDO.

The director emphasized on timely completion of remaining work and assured all support to the team. He said that the hospital would be completed in the shortest period of time. The director held an interaction and appreciated the role of engineers of DRDO lead by Anil Khurana, CCE estates North Chandigarh, Brijesh Kumar Maurya, Estate Manager, Zubair Ali, Scientist ‘E’, Syed AlfarDaniyal, Scientist ‘E’, Amit Rai, Scientist ‘D’, PankajPatil, T. O –B, Vikas Panda, To-do and Sanjay Kumar, TO-A.

The director hailed the role of engineers and other executive agencies in the construction of the hospital.

The spokesman said once the hospital is ready it would be a big boost for the management of Covid management in Kashmir division and a great service to the people.

<https://www.greaterkashmir.com/news/srinagar/director-health-services-interacts-with-drdo-team/>



## DRDO on Twitter



**Rajnath Singh** ✓ @rajnathsingh · 16h

Handed over the first batch of 2-DG anti Covid drug to the Union Health Minister @drharshvardhan after it was released today.

This 2-DG drug developed by @DRDO\_India & DRL is a perfect example of India's scientific prowess and a milestone in the efforts towards self-reliance.



**Rajnath Singh** ✓ @rajnathsingh · 16h

The medicine will play a crucial role in winning the fight against COVID-19. The development and production of the drug is a shining example of public-private sector partnership to help the nation in these challenging times.



**Rajnath Singh** ✓ @rajnathsingh · 16h


When the situation improves, I would personally like to felicitate the scientists who played a major role in the development of the drug as they deserve credit for this wonderful achievement.




**Rajnath Singh** ✓ @rajnathsingh · 19h

The first batch of anti Covid-19 drug, 2-DG is being released. Sharing my thoughts on the occasion.




 **रक्षा मंत्री कार्यालय/ RMO India** ✓ @DefenceMinIndia · 19h ...

अब तक हम डिफेंस के क्षेत्र में डीआरडीओ और प्राइवेट पार्टनरशिप की बात करते थे। आज हेल्थ के सेक्टर में भी डीआरडीओ और प्राइवेट सेक्टर की पार्टनरशिप का इतना अच्छा परिणाम देख कर मुझे वाकई बहुत खुशी हो रही है: रक्षा मंत्री


 **रक्षा मंत्री कार्यालय/ RMO India** ✓ @DefenceMinIndia · 19h ...

मुझे बताया गया, कि इसके प्रयोग से सामान्य उपचार की अपेक्षा लोग ढाई दिन जल्दी ठीक हुए हैं। साथ ही ऑक्सीजन dependency भी लगभग 40 फीसदी तक कम देखने को मिली है। इसका पाउडर फॉर्म में होना भी इसकी एक बड़ी खासियत है। इसे ORS घोल की तरह इसका इस्तेमाल लोग बड़ी आसानी से कर सकेंगे: RM

 **रक्षा मंत्री कार्यालय/ RMO India** ✓ @DefenceMinIndia · 20h ...

इस ड्रग के बारे में मैं कहूंगा कि यह आशा और उम्मीद की एक नई किरण है।

लेकिन अभी हमें निश्चित होने की जरूरत नहीं है, और न ही थकने, और थमने की जरूरत है। क्योंकि यह wave दूसरी बार आई है, और आगे भी इस बारे में कुछ निश्चित नहीं है। हमें पूरी सतर्कता के साथ कदम आगे बढ़ाने होंगे: RM

 **रक्षा मंत्री कार्यालय/ RMO India** ✓ @DefenceMinIndia · 20h ...

DRDO एवं DRL द्वारा तैयार की गई, 2-deoxy-D-glucose (2-DG) ड्रग कोविड में प्रभावकारी सिद्ध होगी। यह हमारे देश के scientific prowess का एक बड़ा उदाहरण है।

इसके लिए मैं DRDO, और इस ड्रग की R&D से जुड़ी सभी संस्थाओं को अपनी ओर से बधाई और शुभकामनाएं देता हूँ: रक्षा मंत्री

 ANI ✓ @ANI

Delhi: Defence Minister Rajnath Singh and Union Health Minister Dr Harsh Vardhan release first batch of Anti-COVID drug 2DG developed by DRDO



10:48 AM · May 17, 2021



Tue, 18 May 2021

# India rapidly building military base in Mauritius to counter China in the Indian Ocean Region

*It seems India is busy building an overseas military base in Mauritius and other regions as well amid China's continued military maneuvers — from the Himalayas to the Indian Ocean*

*By Ayush Jain*

It is no longer a secret that major regional powers such as India, Japan, Australia, South Korea besides the US have been making efforts to establish a foothold in the Indian Ocean Region to counter the Chinese Navy.

The PLA Navy (PLAN), which has the largest surface fleet according to a US Congressional report published last year, is working steadily to be on par with the US military by 2027.

Based on its “string of pearls” theory, Beijing has been proactively building military and commercial bases along its sea lines of communication (SLOCs), which extend from the Chinese mainland to Port Sudan in the Horn of Africa.

These SLOCs or maritime routes run through several chokepoints such as the Strait of Mandeb, the Strait of Malacca, the Strait of Hormuz, and the Lombok Strait as well as other strategic maritime points in Pakistan, Sri Lanka, Bangladesh, the Maldives, and Somalia.

Many commentators in India believe this plan, together with the China–Pakistan Economic Corridor and other parts of China’s Belt and Road Initiative, is a threat to India’s national security. Such a system would encircle India and threaten its power projection, trade, and potentially territorial integrity.

Furthermore, China’s support for India’s traditional enemy, Pakistan, and its Gwadar Port are viewed as a threat, compounded by fears that China may develop an overseas naval military base in Gwadar, which could allow the PLA to conduct expeditionary warfare in the IOR.

To thwart such threats, India is ramping up its naval assets and infrastructure, reports suggest.

### **India’s Military Base in Mauritius**

One such base is Agalega Island that India leased from Mauritius in 2015. The development of required infrastructure has been conducted on a rapid scale since then, and most communication from the Island has been cut off to maintain operational secrecy.

New satellite imagery shows a change in its physical features with an airfield and port development work being undertaken, believed to be worth more than \$87 million.

Once the work is completed, a 3,000-m runway capable of handling the Indian Navy’s P-8I Neptune Maritime Patrol Aircraft and a port that can host other surface vessels and potentially submarines, or other assets of strategic importance will be ready there.

This Agalega airfield will serve as an intelligence outpost for New Delhi, to monitor and respond to threats emerging in the region.

According to the Lowy Institute, this development is in sync with Modi’s 2016 vision for the Indian Ocean, articulated as Security and Growth for All in the Region (SAGAR). Under SAGAR,

New Delhi aims to work together with Indian Ocean regional governments to “engineer virtuous cycles of cooperation”.

### **India’s Cooperation with Foreign Navies**

It is imperative to understand that New Delhi is steadily increasing its cooperation with foreign navies and working with countries in the IOR to establish its bases.

Apart from the Agalega, India also has its strategic listening post and radar facility in Madagascar and a coastal surveillance radar in Seychelles (whose existence is disputed and under shadows of secrecy and political controversies).

There is another listening post at Ras al Hadd. The Indian Navy has berthing rights at Muscat naval base, Oman. In 2018, New Delhi also secured access to facilities at the port city of Duqm in Oman for the Indian Air Force and the Indian Navy.

Duqm could serve as an important base for the Indian military if it wishes to expand its activities in the Middle East, providing security to its assets and combat piracy in the region. In 2017, Oman also signed an MoU with the United Kingdom to have access to facilities at Duqm.

“With berthing rights in Oman and monitoring stations in Madagascar, Mauritius, Kochi, and Mumbai, the navy will effectively box in the region to protect sea lanes right from Mozambique and the Cape of Good Hope to the Gulf of Oman,” an official had told *The Indian Express* when Madagascar station was made operational.

What’s more, Indian military vessels and aircraft can use bases of foreign militaries like the United States and France for replenishment and resupply, including the Reunion Island.

With India keeping a vigil over the Strait of Malacca from the strategically-located Andaman and Nicobar Islands, this new move, along with India’s QUAD cooperation, could prompt China to rethink its strategies.

<https://eurasianimes.com/is-india-building-overseas-military-bases-to-counter-china-in-indian-ocean-region/>

## **THEWEEK**

*Tue, 18 May 2021*

# **Navy hands over decommissioned attack craft to Alappuzha Port Museum**

*The vessel had participated in many coastal security and port defence missions*

The Indian Navy on Monday handed over to the Kerala government a decommissioned fast attack craft at a function held at the Naval Base here. The ship would be taken to Alappuzha and placed as part of the Port Museum under the Alappuzha Heritage Project, a Defence press release said.

The vessel was part of the headquarters, Western Naval Command and had participated in many coastal security and port defence missions along the coasts of Maharashtra and Gujarat.

The role of the ship included day/night surveillance and reconnaissance, coordinated search and rescue operations, beach insertion, extraction of marine commandos and high- speed interception of small, manoeuvrable intruder crafts. The ship had also actively participated in para jumps and duck drops with the Indian Air Force personnel embarked onboard, the release said.

It was decommissioned on January 28 in Mumbai and later towed from Mumbai to Kochi earlier this month.



The attack craft (IN FAC) T-81, the second of the Super Dvora MK II class Fast Attack Craft built by Goa Shipyard Limited, was handed over to the government by Vice-Admiral AK Chawla, Flag Officer Commanding-in-Chief (FOC-in-C), Southern Naval Command.

IN FAC T-81 was commissioned into the Indian Navy on June 5, 1999, by the then Governor of Goa Lieutenant General JFR Jacob, PVSM (Retd).

Kerala Finance Minister T M Thomas Isaac was the chief guest on the occasion.

The function was held with adherence to COVID norms.

<https://www.theweek.in/news/india/2021/05/17/navy-hands-over-decommissioned-attack-craft-to-alappuzha-port-mu.html>



Tue, 18 May 2021

## Bharat Forge to assume full control of missile making subsidiary KSSL

*KSSL and Israeli defence technology company Rafael Advanced Systems are in a \$100 million joint venture order to supply 1,000 Barak-8 MRSAM missiles' kits to state-run Bharat Dynamics*

Bharat Forge will buy the remaining 49 percent stake in Kalyani Strategic Systems (KSSL) at Rs 32.97 crore to make it a fully-owned subsidiary, the Pune-based company disclosed in filings with the stock exchanges. The promoter and promoter group entities of Bharat Forge will off-load their shares in KSSL.

“Since KSSL holds industrial license under the Arms Act, 1959 read with the Arms Rules, 2016, the said acquisition of shares shall be subject to prior approval of Ministry of Home Affairs / Department for Promotion of Industry and Internal Trade”, Bharat Forge added.

KSSL is the holding company for the defence vertical of Bharat Forge Group. This acquisition shall result in making it the wholly-owned subsidiary of Bharat Forge which shall enable it to be eligible for participating in various defence programs, Bharat Forge added in the statement.

KSSL is engaged in the field of developing, deploying defence electronics, systems development, system integration for defence products and components.

KSSL and Israeli defence technology company Rafael Advanced Systems are in a \$100 million joint venture order to supply 1,000 Barak-8 MRSAM missiles' kits to state-run Bharat Dynamics.

<https://www.moneycontrol.com/news/technology/auto/bharat-forge-to-assume-full-control-of-missile-making-subsiary-kssl-6904941.html>





Press Information Bureau  
Government of India

Ministry of Science & Technology

Mon, 17 May 2021 5:49PM

## Scientists develop magnetometer for low cost, reliable & real-time measurements of magnetic fields

Researchers have demonstrated a low-cost digital system to efficiently measure unknown magnetic fields.

Digital signals are the backbone of communication systems processed by hardware systems that transmit and receive the signals with the help of intermediate systems called ‘digital receiver systems’ or DRS. When magnetic matter creates signals, analysing them with DRS lets scientists study the magnetic fields. Analysing the properties of the signals, for example, how they vary with time, scientists can measure the fields and study their small fluctuations.

In a new study, scientists from Raman Research Institute (RRI), Bengaluru, an autonomous institute of the Department of Science & Technology, Government of India, have devised a more efficient, faster, and low-cost digital receiver system that can make precise measurements of magnetic fields. The study was supported by the Department of Science and Technology and the Ministry of Electronics and Information Technology (MeitY) Government of India. It was published in the journal *IEEE Transactions on Instrumentation and Measurement*. The system costs less than 350\$ for all the silicon-based hardware and associated software.

The hardware of digital receiver systems are built with standard silicon-based memory devices. Computer codes are implemented that make these devices perform mathematical operations on the signal they receive, enabling DRS systems to measure fundamental properties of matter like ‘Spin’. The spin of electrons determines the magnetism of most of the objects around us.

“The electrons’ spin is not constant at room temperatures. They fluctuate,” explains Saptarishi Chaudhuri, associate professor of RRI and a co-author of the study. These spin fluctuations cause what scientists call ‘spin-noise’. By measuring the tiny fluctuations in the magnetic field, the researchers can infer the spin-noise accurately.

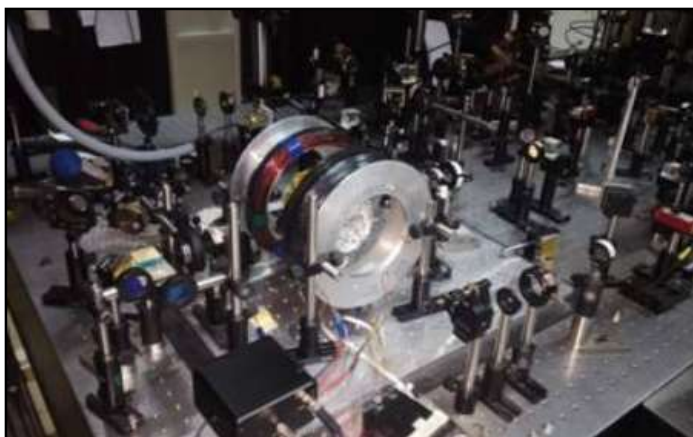
The work is an extension of the Ph.D. thesis work of the co-authors Maheswar Swar and Subhajit Bhar of RRI. The researchers heated rubidium atoms to temperatures ranging between 100 and 200 degrees Celsius, causing spin fluctuations. Then, they bombarded the atoms with a laser, which has a property called ‘polarization’. The spin fluctuations caused the laser’s polarization to fluctuate, which the researchers measured using a light detector. The polarization fluctuation is the signal for the digital receiver system. They then designed the system to work in two different modes.



Image: by Dan-Cristian Pădureț via Unsplash

One of them uses a widely-used mathematical function, the ‘Fourier transform’ of the signal, named after its inventor Joseph Fourier. The Fourier transform of the signal lets them calculate how the rubidium atom’s energies vary, from which they can directly infer the magnetic field. A standard method of measuring the magnetic field analyses small frequency ranges of the signal separately. The researchers showed that their method speeds up the calculations compared to the standard method. Their improved method also increased their confidence in how the electrons’ energies vary more than ten times.

Sometimes, while measuring magnetic fields, the DRS may receive signals only for a short time. In such scenarios, it is essential to record the signal as it gets created without losing any part of it. The researchers successfully implemented this ability with the help of a combination of standard hardware and computer codes. They measured a magnetic field of 800 microgauss — roughly a thousand times smaller than the Earth’s magnetic field, within a tenth of a second.



The photograph of the experiment to measure magnetic fields using the DRS device. Image Credit: Raman Research Institute

There was, however, a problem — electromagnetic interference to the signal the DRS receives. “The source is the power supply to the digital receiver, and radio-frequency signals emanating from other nearby electronic devices, such as the computers, phones, lasers, and other laboratory instruments,” explains V. Mugundhan, another co-author of the study. They got rid of these sources by using a battery bank to power the DRS’s hardware components and shielded them entirely from interference using a 5-millimeter thick layer of mild steel. “We have also developed high-end data processing algorithms to remove the residual interference,” he adds.

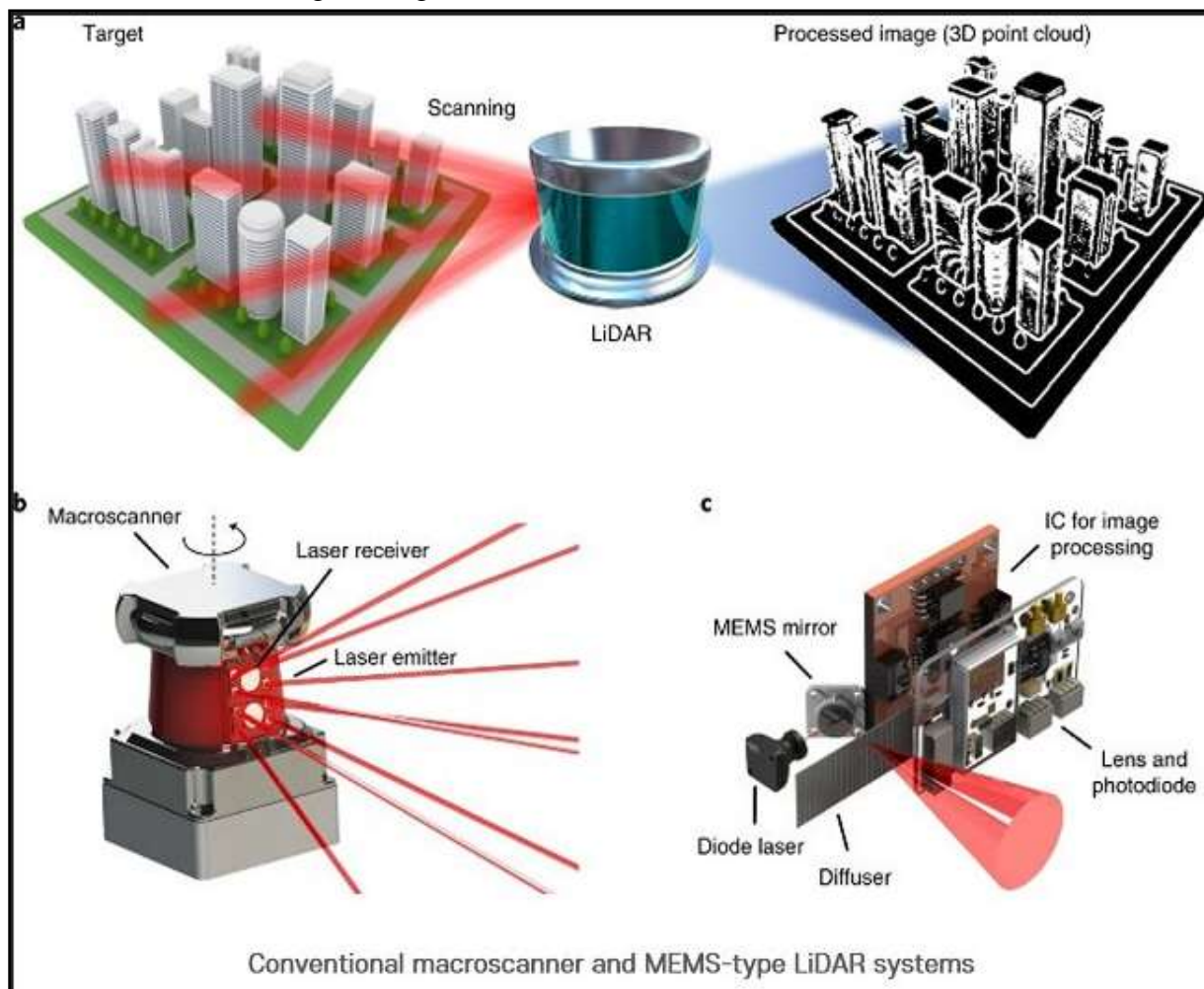
The researchers applied an external magnetic field across the heated rubidium atoms. They demonstrated that their measurement of the magnetic field was consistent with what they expected. Thus, they demonstrated that their two-component digital receiver system works as an atomic magnetometer. “Our magnetometer can be deployed to measure unknown magnetic fields,” says Saptarishi.

Having demonstrated the functioning of a digital receiver system to precisely measure atomic magnetic fields, the researchers are open to large-scale manufacturing or commercialisation of the device. Such a step would require partners in the industry to show interest in the project. “There are no bottlenecks in manufacturing our device on large scales,” Saptarishi pointed out.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1719361>

# A LiDAR device the size of a finger now available

A nanophotonics-based LiDAR technology developed by a POSTECH research team was presented as an invited paper in *Nature Nanotechnology*, the leading academic journal in the field of nanoscience and nanoengineering.



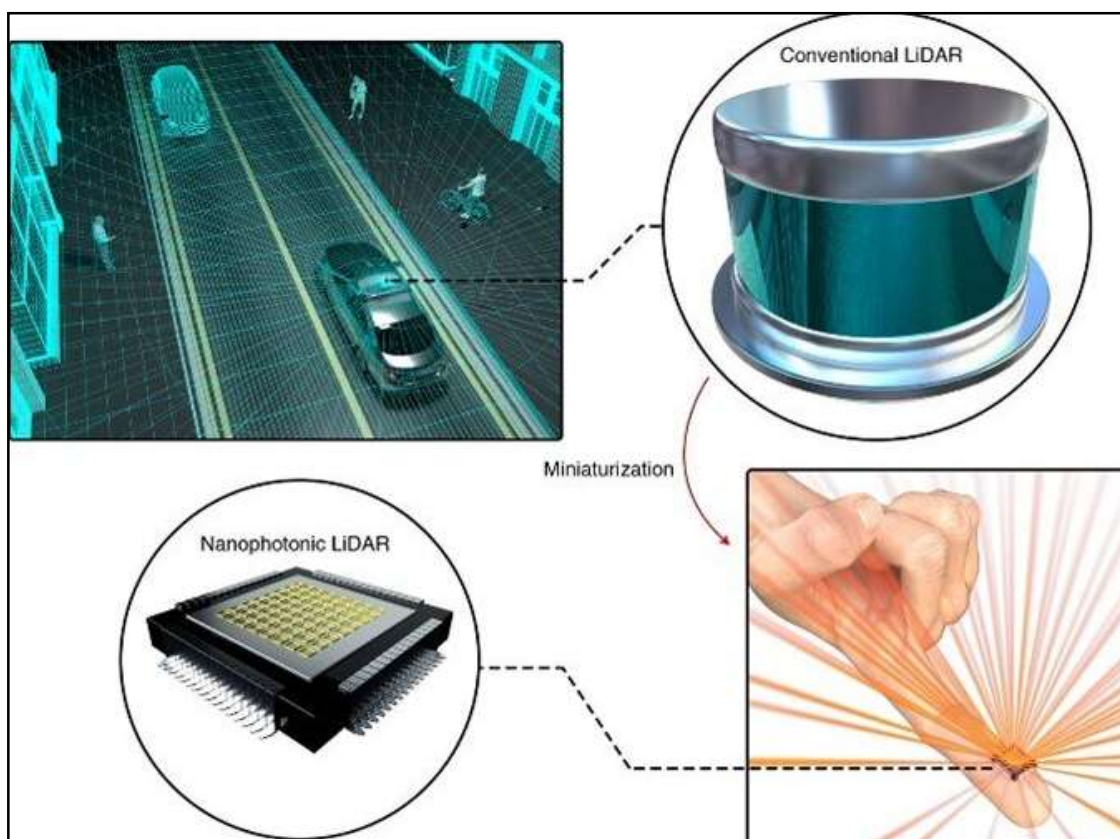
Credit: Pohang University of Science & Technology (POSTECH)

In this paper, a POSTECH research team (led by Professor Junsuk Rho of the departments of mechanical engineering and chemical engineering, postdoctoral researcher Dr. Inki Kim of the Department of Mechanical Engineering, and Ph.D. candidate Jaehyuck Jang of the Department of Chemical Engineering) in cooperation with the French National Science Institute (CNRS-CRHEA) focused on the LiDAR device developed through studying the metamaterials based ultralight nanophotonics.

In addition, the paper introduces core nanophotonic technologies such as the phase-change material-based beam scanning technique, a flash-type LiDAR that does not require beam scanning by applying point-cloud generation device, and light-source device integration and scalable manufacturing methods.

In particular, the paper explains that the ultra-precise LiDAR device developed by the research team can be applied not only to autonomous vehicles, but also to intelligent robots, drones, 3D panoramic cameras, CCTVs, and augmented reality platforms. LiDAR technology collects the depth information of an object by irradiating a laser beam onto the object and measuring the time of its return. LiDAR sensors are gaining attention in the field of future displays from

machineries—such as autonomous vehicles, artificially intelligent robots, and unmanned aerial vehicles—to being mounted on iPhones for 3D face recognition or used in secure payment systems.



**Nanophotonic LiDAR system. Credit: POSTECH**

Currently, the high-end mechanical LiDAR system on the roof of autonomous vehicles is about the size of two adult fists stacked together, and costs tens of thousands of dollars. In addition, there are still many challenges to be overcome, such as a charging process that consumes a huge amount of power and heat management.

As a solution to this, the research team proposed an ultracompact LiDAR technology based on nanophotonics. The researchers explain how this nanophotonic technology can innovate the LiDAR sensor system in various aspects, from the basic measurement principles of LiDAR to the latest ultrafast and ultra-precise nanophotonic measurement methods, and nanophotonic devices such as metasurfaces, soliton microcomb, and optical waveguides.

"Currently, the research team is conducting several follow-up studies to develop ultralight metasurface-based compound LiDAR systems," remarked Professor Junsuk Rho. "If this research is successful, we can look forward to manufacturing affordable ultrafast and ultra-precise LiDAR systems at an affordable cost."

**More information:** Inki Kim et al, Nanophotonics for light detection and ranging technology, *Nature Nanotechnology* (2021). DOI: [10.1038/s41565-021-00895-3](https://doi.org/10.1038/s41565-021-00895-3)

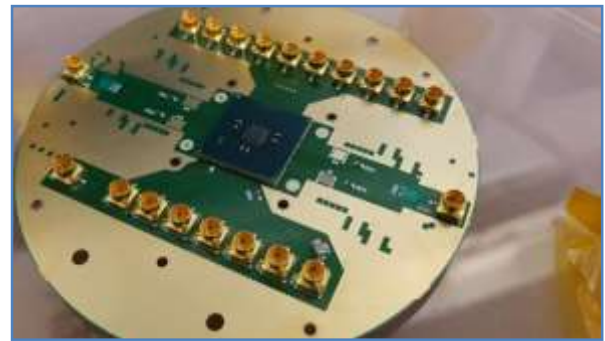
**Journal information:** *Nature Nanotechnology*  
<https://phys.org/news/2021-05-lidar-device-size-finger.html>



## Quantum computing: Cold chips can control qubits

Researchers and engineers from QuTech in the Netherlands and from Intel Corp., jointly designed and tested a chip to control qubits that can operate at extremely low temperatures, and opens the door to solving the "wiring bottleneck," an important step toward a scalable quantum computer. Their results are published in the scientific journal *Nature*.

Each basic unit of a quantum computer, a qubit, is typically addressed individually by a single wire. "This stands in the way of a scalable quantum computer, since millions of qubits would require millions of wires' explains lead investigator Lieven Vandersypen from QuTech. "This is called the 'wiring bottleneck.'" In traditional computers a modern processor with billions of transistors has only a few thousand connections. The cryogenic temperatures at which qubits operate (20 millikelvin or about -273 degrees Celsius) complicate the use of traditional solutions." Such a chip could simply not endure the extreme temperatures, so a new cryogenic control chip has been designed and tested.



Credit: Ecole Polytechnique Federale de Lausanne

### Intel Horse Ridge

Engineers at Intel and QuTech—a collaboration between Delft University of Technology and TNO, the Netherlands Organization for applied scientific research—designed a special silicon-based integrated circuit able to withstand the cold (3 degrees Celsius above absolute zero) and also address qubits. The so-called "Horse Ridge" chip is named after the coldest place in Oregon, the state where the Intel lab resides.

"We exploited the same technology adopted for the conventional microprocessor, the CMOS technology. For Horse Ridge, we specifically used the Intel 22nm low-power FinFET technology." said co-lead investigator Edoardo Charbon, head of EPFL's Advanced Quantum Architecture Laboratory. "As electronic devices operate very differently at cryogenic temperatures, we used special techniques in the chip design both to ensure the right operation and to drive qubits with high accuracy." Ultimately controller chip and qubits can be integrated on the same die (as they are all fabricated in silicon) or package, thus further relieving the wiring bottleneck.

### High fidelity and good programmability

To assess the quality of the cryogenic Horse Ridge control chip it was compared with a classical room temperature controller. It turns out the gate fidelity of the system is very high (99.7%) and limited not by the controller but by the qubits themselves. That's great news for the performance of the cryogenic control chip.

Next, the programmability of the controller was showcased using a two-qubit quantum algorithm. The Deutsch–Jozsa algorithm is one of the simplest algorithms that is much more efficient on a quantum computer than a traditional computer. This demonstrates the ability to program the control chip with arbitrary sequences of operations, and opens the way to on-chip implementation and a truly scalable quantum computer.

**More information:** Xiao Xue et al. CMOS-based cryogenic control of silicon quantum circuits, *Nature* (2021). DOI: [10.1038/s41586-021-03469-4](https://doi.org/10.1038/s41586-021-03469-4)

**Journal information:** *Nature*

<https://phys.org/news/2021-05-quantum-cold-chips-qubits.html>

## Future sparkles for diamond-based quantum technology

Marilyn Monroe famously sang that diamonds are a girl's best friend, but they are also very popular with quantum scientists—with two new research breakthroughs poised to accelerate the development of synthetic diamond-based quantum technology, improve scalability, and dramatically reduce manufacturing costs.

While silicon is traditionally used for computer and mobile phone hardware, diamond has unique properties that make it particularly useful as a base for emerging quantum technologies such as quantum supercomputers, secure communications and sensors.

However there are two key problems; cost, and difficulty in fabricating the single crystal diamond layer, which is smaller than one millionth of a meter.

A research team from the ARC Centre of Excellence for Transformative Meta-Optics at the University of Technology Sydney (UTS), led by Professor Igor Aharonovich, has just published two research papers, in *Nanoscale* and *Advanced Quantum Technologies*, that address these challenges.

"For diamond to be used in quantum applications, we need to precisely engineer 'optical defects' in the diamond devices—cavities and waveguides—to control, manipulate and readout information in the form of qubits—the quantum version of classical computer bits," said Professor Aharonovich.

"It's akin to cutting holes or carving gullies in a super thin sheet of diamond, to ensure light travels and bounces in the desired direction," he said.

To overcome the "etching" challenge, the researchers developed a new hard masking method, which uses a thin metallic tungsten layer to pattern the diamond nanostructure, enabling the creation of one-dimensional photonic crystal cavities.

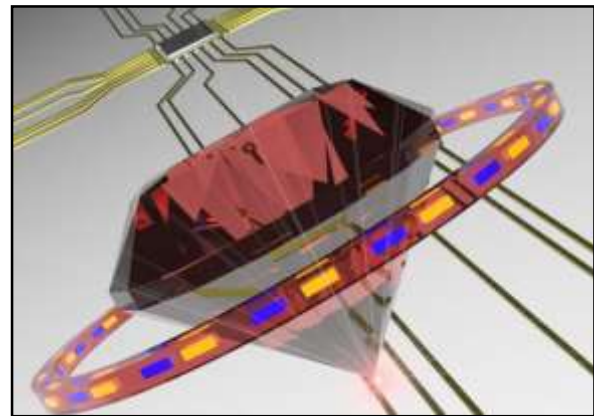
"The use of tungsten as a hard mask addresses several drawbacks of diamond fabrication. It acts as a uniform restraining conductive layer to improve the viability of electron beam lithography at nanoscale resolution," said lead author of paper in *Nanoscale*, UTS Ph.D. candidate Blake Regan.

To the best of our knowledge, we offer the first evidence of the growth of a single crystal diamond structure from a polycrystalline material using a bottom up approach—like growing flowers from seed.

"It also allows the post-fabrication transfer of diamond devices onto the substrate of choice under ambient conditions. And the process can be further automated, to create modular components for diamond-based quantum photonic circuitry," he said.

The tungsten layer is 30nm wide—around 10,000 times thinner than a human hair—however it enabled a diamond etch of over 300nm, a record selectivity for diamond processing.

A further advantage is that removal of the tungsten mask does not require the use of hydrofluoric acid—one of the most dangerous acids currently in use—so this also significantly improves the safety and accessibility of the diamond nanofabrication process.



An artist's impression of a diamond building block in a future photonic circuit. The red color emphasises the germanium vacancy centres emitting at the red spectral range and the ring illustrates the cavity. Image: ARC Centre of Excellence for Transformative Meta-Optics at the University of Technology Sydney (UTS)

To address the issue of cost, and improve scalability, the team further developed an innovative step to grow single crystal diamond photonic structures with embedded quantum defects from a polycrystalline substrate.

"Our process relies on lower cost large polycrystalline diamond, which is available as large wafers, unlike the traditionally used high quality single crystal diamond, which is limited to a few mm<sup>2</sup>" said UTS Ph.D. candidate Milad Nonahal, lead author of the study in *Advanced Quantum Technologies*.

"To the best of our knowledge, we offer the first evidence of the growth of a single crystal diamond structure from a polycrystalline material using a bottom up approach—like growing flowers from seed," he added.

"Our method eliminates the need for expensive diamond materials and the use of ion implantation, which is key to accelerating the commercialisation of diamond quantum hardware" said UTS Dr. Mehran Kianinia, a senior author on the second study.

"Nanofabrication of high Q, transferable diamond resonators" is published in *Nanoscale*.

"Bottom-Up Synthesis of Single Crystal Diamond Pyramids Containing Germanium Vacancy Centers" is published in *Advanced Quantum Technologies*.

**More information:** Blake Regan et al. Nanofabrication of high Q, transferable diamond resonators, *Nanoscale* (2021). [DOI: 10.1039/D1NR00749A](https://doi.org/10.1039/D1NR00749A)

Milad Nonahal et al. Bottom-Up Synthesis of Single Crystal Diamond Pyramids Containing Germanium Vacancy Centers, *Advanced Quantum Technologies* (2021). [DOI: 10.1002/qute.202100037](https://doi.org/10.1002/qute.202100037)

**Journal information:** [Nanoscale](https://doi.org/10.1039/D1NR00749A)

<https://phys.org/news/2021-05-future-diamond-based-quantum-technology.html>

Tue, 18 May 2021

## COVID-19 reduces gray matter in brain regions: study

*COVID-19 patients receiving oxygen therapy or experiencing a fever show a reduced volume of gray matter in the frontal-temporal network of the brain*

COVID-19 patients who receive oxygen therapy or experience fever show a reduced volume of gray matter in the frontal-temporal network of the brain, according to a recent study from Georgia State University and the Georgia Institute of Technology, in the United States.



Image credit: Depositphotos.com

According to the research, published in the journal *Neurobiology of Stress*, it was found that a lower volume of gray matter in this region of the brain was associated with a higher level of disability among COVID-19 patients, even six months later from hospital discharge.

According to the *SciTechDaily* site, gray matter is essential for processing information in the brain and this alteration in its volume can affect the functioning and communication of neurons.

The researchers, affiliated with the Center for Translational Research in Neuroimaging and Data Science (TReNDS), studied CT scans in 120 neurological patients, including 58 with acute COVID-19 and 62 without COVID-19, matched for age, gender and disease. They found "brain abnormalities" and that patients with higher levels of disability had a smaller volume of gray matter in the frontal regions of the brain.

The study findings could be used as a biomarker to evaluate treatment options for the disease.

<https://www.entrepreneur.com/article/372113>

