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समाचार पत्रों से चयित अंश Newspapers Clippings

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CONTENTS

S. No.	TITLE	Page No.
DRDO News		1-14
COVID 19: DRDO's Contribution		1-14
1.	DRDO's anti-Covid drug 2-DG: Second batch of 10,000 packets to be released tomorrow	1
2.	When will DRDO's 2-DG Drug be available for Covid patients in India?	2
3.	अब बाजार में भी मिलेगी DRDO की कोविड-19 रोधी दवा 2-डीजी, कल जारी होगी दूसरी खेप	3
4.	DRDO anti-Covid drug 2-DG: 10,000 पैकेट का दूसरा बैच कल जारी किया जाएगा	4
5.	DRDO ने 14 दिनों में ऋषिकेश में तैयार किया 500 बेड वाला कोविड केयर सेंटर, ये हैं खूबियां	5
6.	CM inaugurates a 500-bed Covid hospital at Rishikesh; AIIMS-R to manage facility	6
7.	डीआरडीओ देगा कानपुर को ऑक्सीजन	7
8.	Tech used in Tejas aircraft to be used for O2 plant in Jalna for Covid patients	8
9.	Gujarat: Venue for iconic business meets now a Covid hospital	9
10.	500-bedded DRDO hospital at Jammu to commence operations from today	11
11.	Puducherry to get DRDO's COVID-19 drug in a week or two: L-G	12
12.	चक्रवात यास: बीएचयू के अस्थायी अस्पताल से शिफ्ट हो सकते हैं कोरोना मरीज	13
13.	Assam Chief Minister praises DRDO Scientist for developing anti-covid drug	14
Defence News		15-17
Defence Strategic: National/International		15-17
14.	Indian Army will soon get 4 Heron TP drones on lease from Israel, plans to deploy them at LAC	15
15.	Won't be long before a woman commands a warship, say female Navy officers deployed at sea	16
Science & Technology News		18-23
16.	Novel heterostructure nanosheet boosts efficiency of lean-electrolyte lithium batteries	18
17.	Laser-driven ion acceleration with deep learning	19
18.	Light-emitting MXene quantum dots	21
COVID-19 Research News		22-23
19.	UK study finds long-term lung damage after COVID-19	22

COVID 19: DRDO's Contribution**mint**

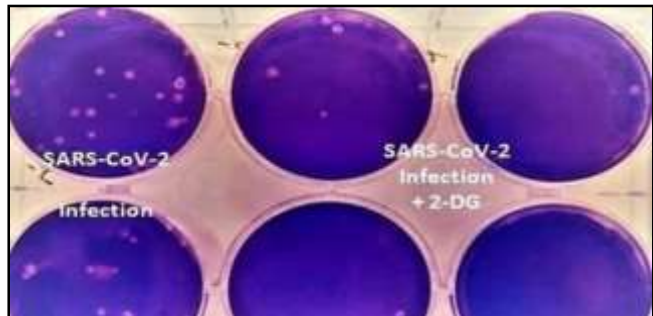
Thu, 27 May 2021

DRDO's anti-Covid drug 2-DG: Second batch of 10,000 packets to be released tomorrow

- *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*

The second batch of anti-COVID drug 2-DG, developed by the DRDO, will be released tomorrow by the manufacturer Dr Reddy's Lab.

According to DRDO officials, "Second batch of 10,000 sachets of DRDO-developed 2DG drug to be issued tomorrow by the manufacturer Dr Reddy's Lab. The drug would be available commercially now," news agency ANI reported.

**DRDO's 2DG drug (DRDO)**

The Drugs Controller General of India (DGCI) has approved the oral drug for emergency use as an adjunct therapy in moderate to severe coronavirus patients, the defence ministry said earlier this month.

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.

"In the ongoing second COVID-19 wave, a large number of patients are facing severe oxygen dependency and need hospitalisation. The drug is expected to save precious lives due to the mechanism of its operation in the infected cells. This also reduces the hospital stay of COVID-19 patients," the defence ministry had said.

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.

The drug comes in a powder form in a sachet and is taken orally by dissolving it in water, the ministry said.

In efficacy trends, it said, patients treated with 2-DG showed a faster symptomatic cure than the standard of care (SoC) on various endpoints.

From the first batch of the medicine, sachets were distributed to the All India Institute of Medical Sciences (AIIMS) and the Director-General of the Armed Forces Medical Services while some were kept as reserve.

A higher proportion of patients treated with 2-DG have shown RT-PCR negative conversion in COVID patients. The drug will be of immense benefit to the people suffering from COVID in the ongoing pandemic.

<https://www.livemint.com/news/india/drdo-anti-covid-drug-2-dg-second-batch-of-10-000-packets-to-be-released-tomorrow-11622037866917.html>



Thu, 27 May 2021

When will DRDO's 2-DG Drug be available for Covid patients in India?

Dr Reddy's has said that the anti-COVID drug has not been launched in the market yet. So, people should be cautious of agents selling spurious or illegal products in the name of 2-DG

Edited by Nivedita R

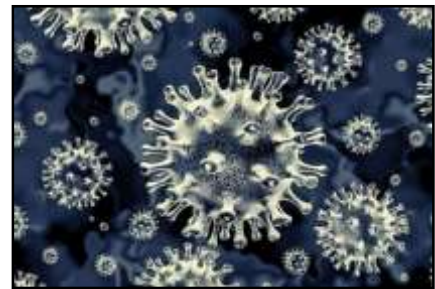
New Delhi: The anti-Covid drug 2-deoxy-D-glucose (2-DG) developed by the Institute of Nuclear Medicine and Allied Sciences (INMAS), New Delhi, a lab of the Defence Research and Development Organisation (DRDO), in collaboration with Hyderabad-based pharma company Dr Reddy's Laboratories (DRL) is one of the highly anticipated drugs in the fight against the deadly coronavirus. At a time when the coronavirus cases are continuously rising in the country, people are eagerly awaiting its availability in the markets.

When will DRDO's 2-DG Drug be available for COVID Patients in India?

According to a TOI report, on Wednesday, Dr Reddy's said in a statement that the supply of anti-COVID drug 2-DG is expected to commence in mid-June. In a statement, Hyderabad based Dr Reddy's said that the drug has not been launched in the market yet and people should be cautious of agents selling spurious or illegal products in the name of 2DG.

How does 2-DG work?

According to the reports, the government has claimed that 2-DG is expected to bring "immense benefit" to the affected patients. The drug, according to a report by The IE, accumulates in virus-infected cells of the body and prevents the virus growth. Because of this, viral synthesis as well as the energy production of the virus can be stopped. The property of only accumulating in virally-infected cells has made this drug unique.



When Will DRDO's 2-DG Drug be Available For COVID Patients in India?

Benefits of the anti-COVID drug 2-DG

The government, as per the reports, has said that 2-DG, being a generic molecule and an analogue of glucose, can be easily produced and made available in large quantities. The anti-COVID drug is available in powder form in a sachet, and can be taken orally after dissolving in water.

Meanwhile clinical trial results have shown that this drug helps in faster recovery of hospitalised patients and reduces supplemental oxygen dependence.

<https://www.india.com/health/when-will-drdo-2-dg-drug-be-available-for-covid-patients-in-india-4692274/>

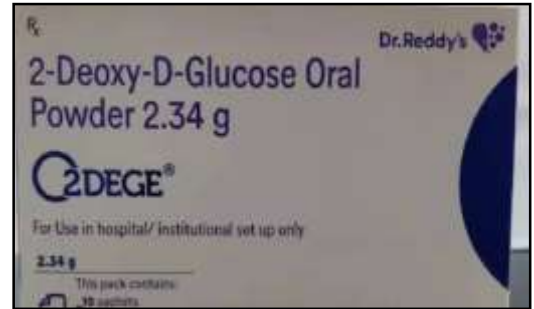
अब बाजार में भी मिलेगी DRDO की कोविड-19

रोधी दवा 2-डीजी, कल जारी होगी दूसरी खेप

Covid Medicine 2DG: डीआरडीओ की इस दवा की पहली खेप एक हफ्ते पहले 17 मई को ही जारी की गई थी। 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।

नई दिल्ली: रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) की ओर से विकसित की गयी कोविड-19 रोधी दवा 2-डीजी (Covid-19 Medicine 2DG) की दूसरी खेप गुरुवार को जारी की जाएगी। डॉ रेड्डीज़ लैब इसे जारी करेगी। इस खेप में 2डीजी दवा के 10,000 सैशे जारी किए जाएंगे। प्राप्त जानकारी के मुताबिक अब ये दवा बाजार में भी उपलब्ध हो सकेगी। कोविड-19 की दूसरी लहर से देश में जारी संघर्ष के बीच रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) की ओर से विकसित की गयी कोविड-19 रोधी दवा 2-डीजी की पहली खेप 17 मई को जारी की गई थी।

रक्षा मंत्री राजनाथ सिंह ने केंद्रीय स्वास्थ्य मंत्री हर्षवर्धन के साथ इसे जारी करते हुए कहा कि 2-डीजी दवा आत्मनिर्भरता की दिशा में मील का पत्थर है। 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।



2 DG दवा की पहली खेप 17 मई को जारी की गई थी (सांकेतिक तस्वीर)

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।”

ऑक्सीजन की निर्भरता को कम करती है ये दवा

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।

उन्होंने कहा, “मुझे बताया गया है कि इस दवा के उपयोग से सामान्य अवधि के मुकाबले मरीज दो से ढाई दिन पहले ठीक हो रहे हैं। कोविड रोगियों की ऑक्सीजन पर निर्भरता 40 प्रतिशत कम होगी। पाउडर के रूप में उपलब्ध होने से लोगों का असानी भी होगी। वह इसे पानी में घोलकर आसानी से पी सकेंगे।”

रक्षा मंत्री ने सभी संबंधित संस्थानों से कंधे से कंधा मिलाकर काम करने की अपील करते हुए कहा कि यदि सभी मिलकर काम करेंगे तो देश विजयी होकर रहेगा।

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.news18.com/news/nation/second-batch-of-10000-sachets-of-drdo-developed-2dg-drug-to-be-issued-tomorrow-3600932.html>



Thu, 27 May 2021

DRDO anti-Covid drug 2-DG: 10,000 पैकेट का दूसरा बैच कल जारी किया जाएगा

डीआरडीओ द्वारा विकसित 2डीजी दवा के 10000 पाउच का दूसरा बैच कल निर्माता डॉ रेड्डीज लैब द्वारा जारी किया जाएगा। दवा अब व्यावसायिक रूप से उपलब्ध होगी। मध्यम से गंभीर कोरोना वायरस रोगियों में एक सहायक चिकित्सा के रूप में आपातकालीन उपयोग के लिए इस दवा को मंजूरी।

By Nitin Arora

नई दिल्ली: डीआरडीओ द्वारा विकसित एंटी-कोविड ड्रग 2-डीजी का दूसरा बैच कल निर्माता डॉ रेड्डीज लैब द्वारा जारी किया जाएगा। समाचार एजेंसी एएनआइ ने बताया, 'डीआरडीओ द्वारा विकसित 2डीजी दवा के 10,000 पाउच का दूसरा बैच कल निर्माता डॉ रेड्डीज लैब द्वारा जारी किया जाएगा।' डीआरडीओ के अधिकारियों के अनुसार, 'दवा अब व्यावसायिक रूप से उपलब्ध होगी।'

रक्षा मंत्रालय ने इस महीने की शुरुआत में कहा कि ड्रग्स कंट्रोलर जनरल ऑफ इंडिया (डीजीसीआई) ने मध्यम से गंभीर कोरोना वायरस रोगियों में एक सहायक चिकित्सा के रूप में आपातकालीन उपयोग के लिए इस दवा को मंजूरी दे दी है। दवा को मंजूरी ऐसे समय में मिली है जब भारत कोरोना वायरस महामारी की दूसरी व भयावह लहर से जूझ रहा है जिसने देश के स्वास्थ्य ढांचे को हिलाकर रख दिया।

रक्षा मंत्रालय ने कहा था, 'चल रही दूसरी COVID-19 लहर में, बड़ी संख्या में रोगियों को ऑक्सीजन की कमी का सामना करना पड़ा और उन्हें अस्पताल में भर्ती होने की आवश्यकता पड़ी। संक्रमित कोशिकाओं में इसके संचालन के तंत्र के कारण दवा के कीमती जीवन को बचाने की उम्मीद है। यह COVID-19 रोगियों के इलाज में सुधार लाएगा, जिससे अस्पताल नहीं भी जाना हो सकता है।'

हैदराबाद में डॉ रेड्डीज लेबोरेटरीज (DRL) के सहयोग से DRDO की एक प्रमुख प्रयोगशाला, इंस्टीट्यूट ऑफ न्यूक्लियर मेडिसिन एंड अलाइड साइंसेज (INMAS) द्वारा दवा के एंटी-कोविड चिकित्सीय अनुप्रयोग को विकसित किया गया है। मंत्रालय ने कहा कि दवा एक पाउच में पाउडर के रूप में आती है और इसे पानी में घोलकर लिया जाता है।

<https://www.jagran.com/news/national-drdo-anti-covid-drug-2-dg-the-second-batch-of-10000-packets-will-be-released-tomorrow-21679675.html>

DRDO ने 14 दिनों में ऋषिकेश में तैयार किया 500 बेड वाला कोविड केयर सेंटर, ये हैं खूबियां

DRDO ने उत्तराखंड के ऋषिकेश में कोरोना मरीजों के लिए 500 बिस्तरों वाला कोविड केयर सेंटर शुरू कर दिया है। COVID-19 के खतरनाक हालात में DRDO ने मात्र 14 दिनों में इस कोविड केयर सेंटर को तैयार किया है।

By राजीव रंजन, Edited by तूलिका कुशवाहा

ऋषिकेश: सरकारी संगठन डिफेंस रिसर्च एंड डेवलपमेंट ऑर्गेनाइजेशन (DRDO) ने उत्तराखंड के ऋषिकेश में कोरोना मरीजों के लिए 500 बिस्तरों वाला कोविड केयर सेंटर शुरू कर दिया है। COVID-19 के खतरनाक हालात में DRDO ने मात्र 14 दिनों में इस कोविड केयर सेंटर को बना दिया। खासकर, ऐसी मुश्किल स्थिति में DRDO ने काम किया जब देश में लॉकडाउन हो और कई सरकारी एजेंसियों के बीच तालमेल कर काम को अंजाम देना हो। इसके लिए तकनीशियनों सहित 300 कर्मचारियों को रातों-रात जुटाया गया।

सीसीई (आर एंड डी) वेस्ट के जीआई वाधवा के नेतृत्व में डीआरडीओ टीम के नेतृत्व में सिर्फ 14 दिनों में अस्पताल को तैयार करने के लिए चौबीसों घंटे काम किया। इस अत्याधुनिक कोविड केयर सेंटर में बच्चों के लिए 44 बिस्तरों सहित 400 बिस्तरों वाले आइसोलेशन वार्ड शामिल हैं। इसके अलावा एम्स में 100 आईसीयू बिस्तर उपलब्ध कराए गए हैं।



DRDO ने ऋषिकेश में 14 दिनों में तैयार किया कोविड केयर सेंटर

केअर सुविधा को चलाने के लिए डॉक्टरों और नर्सिंग स्टाफ एम्स ऋषिकेश द्वारा उपलब्ध कराया जाएगा। कोविड अस्पताल में सभी बेड के लिए एमजीपीएस सिस्टम के साथ 24x7 हाई फ्लो ऑक्सीजन और रिजर्व सहित समर्पित 20KL और 13KL मेडिकल ऑक्सीजन स्टोरेज जैसी कई सुविधाएं हैं। कोविड अस्पताल सभी मौसमों के लिए केंद्रीय रूप से वातानुकूलित है।

इसमें पैथोलॉजी प्रयोगशाला, फार्मसी, एक्स-रे और ईसीजी आदि सुविधा भी मौजूद हैं। 100% पावर बैकअप के साथ उच्च गुणवत्ता वाली विद्युत वितरण प्रणाली भी है ताकि बिजली से जुड़ी कोई परेशानी ना हो। अग्नि पहचान अलार्म प्रणाली, अग्नि हाइड्रेंट और अग्निशामक उपकरणों के साथ अनिवार्य अग्नि सुरक्षा मानदंड सुनिश्चित किए गए हैं। एक समर्पित सिस्टम सॉफ्टवेयर के माध्यम से उचित निगरानी और अस्पताल प्रबंधन के लिए वाईफाई और सीसीटीवी के साथ एक नियंत्रण केंद्र भी स्थापित किया गया है।

इस कोविड देखभाल केंद्र को भारतीय सेना के जांबाज सैनिक राइफलमैन जसवंत सिंह रावत महावीर चक्र के नाम पर रखा गया है। यह उत्तराखंड के ही थे और अरुणाचल प्रदेश के नूरनांग में 1962 में भारत चीन युद्ध में चीनियों से लड़ते हुए अपने जीवन का बलिदान दिया था।

राज्य और देश में वर्तमान खतरनाक COVID स्थिति में, यह कोविड देखभाल केंद्र उत्तराखंड सरकार द्वारा COVID के खिलाफ लड़ने और राज्य के मूल निवासियों को आवश्यक समय पर चिकित्सा प्रदान करने के लिए एक क्रांतिकारी कदम के रूप में कार्य करेगा।

<https://ndtv.in/india-news/drdo-covid-hospitals-drdo-sets-up-500-bed-covid-care-center-in-rishikesh-uttarakhand-2449531>

THE TIMES OF INDIA

Thu, 27 May 2021

CM inaugurates a 500-bed Covid hospital at Rishikesh; AIIMS-R to manage facility

By Kautilya Singh

Dehradun: Chief Minister Tirath Singh Rawat on Wednesday inaugurated a 500-bed hospital in the IDPL campus at Rishikesh. The medical facility, to be run by AIIMS Rishikesh, has been set up by the Defence Research and Development Organisation (DRDO) in just two weeks. The hospital has been named after 1962 India-China war hero Rifleman Jaswant Singh Rawat and is equipped with 500 oxygen beds. The facility also has separate sections for children and cases of black fungus.

“There has been a rapid increase in the healthcare facilities in the state. There is adequate availability of oxygen, ventilator ICUs and oxygen beds. Soon, a 500-bed Covid Care Center will also be made ready in Haldwani,” the CM said while inaugurating the hospital. He added that adequate steps are being taken by the state government for containing Covid-19 cases.

Earlier in the day, the CM had inaugurated 30 additional ICU beds in Srinagar Medical College through video-conferencing.

<https://timesofindia.indiatimes.com/city/dehradun/cm-inaugurates-a-500-bed-covid-hospital-at-rishikesh-aiims-r-to-manage-facility/articleshow/82984142.cms>

डीआरडीओ देगा कानपुर को ऑक्सीजन

हैलट में अब डीआरडीओ लगाएगा ऑक्सीजन जनरेशन प्लांट

- हैलट में 1 हजार लीटर क्षमता वाला ऑक्सीजन जनरेशन प्लांट लगाएगा, पीएम केयर्स फंड की मदद से लगाने को सहमति
- जिस टेक्नोलॉजी पर बेस्ड प्लांट हैलट में डीआरडीओ लगाएगा, फाइटर प्लेन तेजस में भी किया जाता है उसका यूज

KANPUR: कोरोना पीके दौरान शहर में जिस तरह का ऑक्सीजन संकट देखा गया, ऐसी स्थिति भविष्य में फिर न बने, इसके लिए बड़े स्तर पर तैयारियां हो रही हैं। ऑक्सीजन सिलेंडर व लिक्विड ऑक्सीजन पर निर्भरता खत्म करने के लिए हैलट में डीआरडीओ 1 हजार लीटर क्षमता का ऑक्सीजन जनरेशन प्लांट लगाएगा। डिफेंस रिसर्च एंड डेवलपमेंट आर्गनाइजेशन(डीआरडीओ) जिस टेक्नोलॉजी पर बेस्ड ऑक्सीजन जनरेशन प्लांट को हैलट में लगाएगा, उस टेक्नोलॉजी का यूज फाइटर प्लेन तेजस में भी किया जाता है। पीएम केयर फंड से इस प्लांट को जीएसवीएम मेडिकल कॉलेज में लगाने पर मुहर लग गई है।



जगह भी हो गई फाइनल

कॉलेज प्रशासन की ओर से इस प्लांट को लगाने के लिए जगह भी चिन्हित कर दी गई है। उर्सला में लगे ऑक्सीजन जनरेशन प्लांट के मुकाबले इसकी क्षमता दो गुनी होगी। जिसमें एक मिनट में एक हजार लीटर ऑक्सीजन बन सकेगी। मालूम हो कि हैलट अस्पताल में न्यूरो साइंस बिल्डिंग के पास भी एक 500 लीटर प्रतिमिनट क्षमता का ऑक्सीजन जनरेशन प्लांट लगाया जा रहा है। जिसके बाद लिक्विड ऑक्सीजन व ऑक्सीजन सिलेंडर का प्रयोग कम हो जाएगा। जिससे ट्रांसपोर्टेशन में आने वाला खर्च भी कम होगा। मालूम हो कि इस बार कोरोना संक्रमण के पीक में सिर्फ अप्रैल महीने में ही लाखों लीटर ऑक्सीजन की हैलट में खपत हुई। इस दौरान 77 लाख रुपए का पेमेंट ऑक्सीजन सप्लाई करने वाली कंपनियों को किया गया।

तेजस में ऑक्सीजन जनरेशन की क्या है टेक्नोलॉजी

- तेजस फाइटर जेट में पायलट को ऑक्सीजन की सप्लाई के लिए डीआरडीओ ने ऑनबोर्ड ऑक्सीजन जनरेशन सिस्टम डेवलप किया था।
- ऑक्सीजन जनरेशन प्लांट प्रेशर स्विंग अडजॉब्शन टेक्नोलॉजी का प्रयोग करता है। जिसमें ऑक्सीजन को सीधे इनवायरमेंट से लिया जाता है।
- इसी टेक्नोलॉजी का प्रयोग अब डीआरडीओ अस्पतालों में ऑक्सीजन प्लांट लगाने के लिए कर रहा है। लेह लद्दाख में ऐसे प्लांट को इंस्टॉल कर चुका है।

अभी ऑक्सीजन सप्लाई का सिस्टम

3- लिक्विड ऑक्सीजन प्लांट 10 हजार लीटर के

7- पाइपड ऑक्सीजन सिलेंडर प्लांट

क्या खास होगा इस एलएमओ में-

- 1 हजार लीटर प्रति मिनट ऑक्सीजन बनेगी
- 195 बड़े ऑक्सीजन सिलेंडर के बराबर
- 190 पेशेंट्स के लिए पर्याप्त होगी ऑक्सीजन
- 5 लीटर प्रति मिनट अगर ऑक्सीजन दी जाए

डीआरडीओ एक हजार लीटर क्षमता का ऑक्सीजन जनरेशन प्लांट लगाएगा। इसके लिए हैलट इमरजेंसी के पीछे जगह चिन्हित की गई है। पीएम केयर से लगने वाले इस प्लांट से एलएमओ और ऑक्सीजन सिलेंडरों पर निर्भरता कम होगी।

- प्रो.आरबी कमल, प्रिंसिपल जीएसवीएम मेडिकल कॉलेज

<https://www.inextlive.com/uttar-pradesh/kanpur/drdo-will-give-oxygen-to-kanpur-295184>

THE TIMES OF INDIA

Thu, 27 May 2021

Tech used in Tejas aircraft to be used for O2 plant in Jalna for Covid patients

By Sandip Didge, Prasad Joshi

Pune: The technology developed by Defence Research and Development Organisation (DRDO) for light combat aircraft Tejas will be used in producing medical oxygen for Covid care facilities at Jalna.

A senior DRDO Scientist told TOI over the phone from New Delhi on Wednesday, “Our Defence Bioengineering and Electromedical Laboratory in Bangalore has developed the technology in the form of a Medical Oxygen Plant (MOP). It is an offshoot technology from the Onboard Oxygen generation system being developed for the light combat aircraft Tejas.”

The MOP generates oxygen directly from the air by utilising pressure swing absorption and molecular sieve technology. “The DRDO has carried out transfer of technology to two firms to generate oxygen, which will be supplied to Covid hospitals in the future,” the DRDO scientist said.

Resident deputy collector for Jalna, Ravindra Paralikar, on Wednesday said that the district civil hospital at Jalna would be the first beneficiary of MOP developed using DRDO technology.

“The district civil hospital will get an oxygen plant having a capacity of 1,000 litre per minute and is expected to get commissioned by the end of the current month. The upcoming plant, in general, can cater to oxygen needs of 190 patients and fill 195 jumbo cylinders per day,” he said.

It will be followed by Government Women’s Hospital at Jalna and Covid care facility at Rajur. Both these facilities will get a plant each with a capacity of 500 litre per minute and 100 liter per minute, respectively, with commissioning scheduled by mid of next month.

Paralikar said that the National Highway Authority of India was taking care of infrastructural and other needs required for raising of medical oxygen plants coming up at Jalna. “The district administration will not have to bear any cost towards these plants. The facilities will be useful in fulfilling the requirement of oxygen, especially during the third-wave of the pandemic which is predicted by experts,” he said.

<https://timesofindia.indiatimes.com/city/pune/tech-used-in-tejas-aircraft-to-be-used-for-o2-plant-in-jalna-for-covid-patients/articleshow/82986513.cms>

Gujarat: Venue for iconic business meets now a Covid hospital

Sources told The Indian Express that the civil hospital authorities were more than eager to shed off some of their burden to the new facility and start catering to the huge number of non-Covid patients coming to it from across the district

By Ritu Sharma

Gandhinagar: Mahatma Mandir, a venue for iconic business congregation Vibrant Gujarat Global Summit in Gandhinagar that has hosted several foreign dignitaries, including former United Nations secretary-general Ban Ki Moon, former US secretary of state John Kerry and World Bank former president Jim Yong Kim, is all set to be converted into a 900-bed Covid hospital.

A joint collaboration of the state government and the Defence Research and Development Organisation (DRDO), and funded by the Tata Trust, the DRDO facility is currently awaiting a nod from the state government's core committee on Covid, presided over by Chief Minister Vijay Rupani, to start admitting patients, Collector Kuldeep Arya told The Indian Express.

Once operational, all Covid patients coming to Gandhinagar will be directly admitted to the DRDO Covid hospital at Mahatma Mandir which is likely to take the load off GMERS civil hospital that is currently treating the bulk of Covid patients from across the district.

"Preparations are complete and we are ready to admit patients. The DRDO facility will serve as an extension of GMERS Gandhinagar civil hospital, and its medical staff has been deployed at Mahatma Mandir Covid Hospital," Arya said.

Four hundred beds are reserved for Covid-19 patients at the GMERS civil hospital. Of these, 350 are currently occupied. At least 200 non-Covid patients are also undergoing treatment at the civil hospital, the collector added.

Until Wednesday, Gandhinagar reported 20,390 positive cases and 199 fatalities.

When the reporter visited the Mahatma Mandir facility on Wednesday, GMERS civil hospital staff were seen busy running from one point to another to ensure the right material reaches the right place even as contractual workers unloaded and carried equipment to their location.

Sources told The Indian Express that the civil hospital authorities were more than eager to shed off some of their burden to the new facility and start catering to the huge number of non-Covid patients coming to it from across the district. A "delay" in starting operations at the DRDO facility, they claimed, was likely due to an ongoing process of appointment of medical, paramedical and supporting staff to run the facility.

Spread across four major halls with an area of 12,000 square metres, the Covid facility covers nearly all the entire area of the Mahatma Mandir Convention and Exhibition Centre, which is also connected to Dandi Kutir (Salt Mount) Museum through a bridge, barring its main convention hall.

"Within 15 days of taking it over, the work (at the Covid facility) from our side was 100 per cent complete. All 900 oxygen beds are ready. The only point is refilling of an oxygen tank that can sustain for a day for all 900 beds, including ICU ward," a senior DRDO official at the site said.



Spread across four major halls, the Covid facility covers nearly all the entire area of the Mahatma Mandir Convention and Exhibition Centre. (Express Photo by Ritu Sharma)

The 100-bed general ward 1 has come up at the photo gallery area next to the main convention centre while the general ward 2, with 162 beds, has come up at the exhibition hall number 3 and is right beside the main convention centre. General ward 3, with a bed capacity of 392, has been built in exhibition hall 1 and the 225 ICU beds have come up at exhibition hall 2.

Initially, the DRDO's covid facility was set to come up at Gandhinagar's helipad in sector 17. An announcement was also made by Union Home Minister Amit Shah during his visit to the DRDO-Gujarat University Dhanvantari Covid Hospital on April 23. However, due to several issues arising at the helipad site, Mahatma Mandir was shortlisted and approved by the DRDO and state government.

“The hangers at the helipad did not have a permanent air-conditioner system. There were other issues like sewage system, power back-up system among other infrastructure issues,” the DRDO official, who did not wish to be named, said.

The Mahatma Mandir Covid Hospital claims to have “carried out minimum modification” in the available infrastructure at the convention centre. Partitions in the centrally air-conditioned halls have been made out of rapid fabrication technique with 12 mm particle board and an aluminium framework.

“It has separate green zones for doctors and medical staff with changing room facilities, toilets, cafeteria, 21-bed triage area with a facility of ventilators, a 24×7 power back-up system, 56 KL liquid medical oxygen station has been installed near gate number 6 and nursing cubicles in-wall wards. Ventilators are provided at 225 ICU beds, including 175 from PM Cares Fund,” Dr Kundan Patel, the assistant resident medical officer of Mahatma Mandir Covid Hospital, told The Indian Express.

A state government property, Mahatma Mandir is managed by Gandhinagar Railway and Urban Development Corporation Limited (GARUD), which is a joint venture company (JVC) incorporated on January 5, 2017, between the Government of Gujarat and Indian Railway Stations Development Corporation Limited (IRSDCL).

“Also, a third private partner in this JVC is The Leela Group. While the Gandhinagar Civil Hospital will run Mahatma Mandir Covid hospital, the basic civil and electrical engineering work on the site including CCTV cameras and electrification work has been carried out by GARUD,” the Gandhinagar collector said.

<https://indianexpress.com/article/india/gujarat-venue-for-iconic-business-meets-now-a-covid-hospital-7331923/>

500-bedded DRDO hospital at Jammu to commence operations from today

DRDO to commence operation of temporary COVID hospital set up with 500 beds in Jammu today. Srinagar to start this facility July 1 onwards

By Gursimran Singh

500-bedded temporary hospitals which are being established by the Defence Research and Development Organization will commence operations at Jammu from today and at Srinagar from 1 July. This was shared by Jammu and Kashmir Chief Secretary B V R Subrahmanyam during a high-level meeting chaired by Union Home Secretary, Ajay Kumar Bhalla to review the management of the COVID-19 pandemic across all Union territories



It was mentioned that J&K is performing reasonably well in mitigating the second wave of the COVID-19 pandemic with 3,946 cases per million population being reported over the last two weeks and 62 deaths per million during the same period. J&K CS requested that to establish continuous oxygen supply to these facilities, two dedicated oxygen tankers for these hospitals be provided to Jammu and Kashmir.

J&K vaccinated 66% beneficiaries of above 45 years age group

"Giving a brief of the measures being taken in J&K to contain the spread of COVID, the Chief Secretary informed that the Government has enhanced both testing and vaccination capacities.

"The early detection of infection has allowed for timely medical intervention, whereas vaccination was found to reduce the severity of disease in patients - both strategies have been successful in restricting COVID-related fatalities in the UT", he added.

Currently, Jammu and Kashmir are among the leading regions in the country in vaccination of above 45 years age group having vaccinated 66% of its eligible population which is well above the national average of 32%. Within J&K, 4 districts- Ganderbal, Jammu, Samba, and Shopian, have achieved 100% coverage in this category, while the remaining continue with promising progress. To pace up vaccination in 18-45 age category, it was requested that Jammu and Kashmir be provided with a sustained supply of vaccines in the coming months," J&K Government Statement said.

It also added that the Chief Secretary informed that through Government's timely response, the daily number of COVID cases has reduced from an all-time high of 5500 to 2200 in two weeks. The same period also witnessed a reduction in the case positivity rate from 13% to 6.2%. It was highlighted that the districts having higher vaccination rates reported lower positivity rates, thus establishing a correlation between vaccination and the success of containment measures.

Rural districts require added attention- J&K Government

"J&K requested that considering the rural spread of the disease, two 250-bedded DRDO designed hospitals be additionally approved for peripheral districts. Underscoring the shift of disease's catchment area, the Chief Secretary pointed out that in Jammu and Kashmir more cases are now being reported from rural than urban areas, adding that such cases are as high as 55% and 60% in Jammu and Kashmir divisions, respectively," Statement read.

<https://www.republicworld.com/india-news/general-news/500-bedded-drdo-hospital-at-jammu-to-commence-operations-from-today.html>

Puducherry to get DRDO's COVID-19 drug in a week or two: L-G

The drug helps COVID-19 patients get over dependence on supplemental oxygen support

Puducherry: Soon, doctors treating COVID-19 patients in Puducherry will have a new drug in their armamentarium — the 2DG or deoxy-D-glucose, indigenously and jointly developed by the Defence Research and Development Organisation (DRDO) and Dr. Reddy's Laboratories in Hyderabad.

Lt. Governor TAMILISAI SUNDARARAJAN, who returned from Telangana late on Tuesday with a few samples of the drug, said 2DG is expected to be made available in Puducherry in a week or two when nation-wide distribution begins.

The newly-developed drug helps COVID-19 patients improve symptomatically and get over dependence on supplemental medical oxygen support, said Ms. Soundararajan, a physician herself. In fact, the drug, which is administered over a ten-day regimen, can get a patient off oxygen support in a span of four days.

The Lt. Governor said she had held a video-conference with the pharmaceutical company to place a request for distribution of stock to the Union Territory. She has also appealed to manufacturers of the Sputnik vaccine in India to set up a production facility in Puducherry, with the jobs created for local youth an added advantage.

She also handed over boxes of masks, face shields, PPE kits, oxygen concentrators and disinfectants donated by various charities in Hyderabad to Health Secretary T. Arun.

Later, at a function hosted at the Raj Nivas on Wednesday, the Lt. Governor received cash and material donations from various institutions and individuals.

Lenovo India, under the aegis of CII, donated 10 oxygen concentrators and 150 pulse oximeters, Easorn Pharma, a Puducherry-based business firm, donated medical supplies, including sanitisers, masks, hand gloves and face shields.

The Trust for Youth and Child Leadership, an NGO in Puducherry, handed over a cheque for ₹1.2 lakh for the *Uyir Katru*, the Covid Fundraiser scheme.

Shyam Prasanna, a Class 5 student of Jawahar Vidyalaya also donated ₹2,773 towards *Uyir Katru*.

The Lt. Governor received the funds and consignments in the presence of Mr. Arun, and Abhijit Vijay Chaudhari, Secretary to Lt. Governor, G. Sriramalu, Director, State Health Mission and senior officers and CII representatives.

Ms. Soundararajan also launched 'Pahirvoma' a tele counselling facility to provide psycho-social help to people in the wake of the pandemic. This is an initiative of Covid War Room with Department of Social work, Pondicherry University. People may avail psycho-social support by dialling 0413-2262547. The support system will be available from 10 a.m. to 8 p.m. daily.

<https://www.thehindu.com/news/cities/puducherry/puducherry-to-get-drdo-covid-19-drug-in-a-week-or-two-l-g/article34653355.ece>



Lt. Governor TAMILISAI SUNDARARAJAN arriving with COVID-19 materials from Telangana on Tuesday. | Photo Credit: HANDOUT E MAIL

चक्रवात यास: बीएचयू के अस्थायी अस्पताल से शिफ्ट हो सकते हैं कोरोना मरीज

सार

यास तूफान का असर अगर ज्यादा दिखता है, मरीज बीएचयू सुपरस्पेशियलिटी ब्लॉक में शिफ्ट हो जाएंगे। चक्रवाती तूफान यास को लेकर डीआरडीओ अस्पताल प्रशासन अलर्ट पर है।

विस्तार

वाराणसी: बंगाल की खाड़ी से उठने वाले चक्रवाती तूफान यास को लेकर जिला प्रशासन तो अलर्ट है ही अब बीएचयू में डीआरडीओ की ओर से बने अस्थायी अस्पताल में भर्ती कोरोना मरीजों की सेहत को लेकर भी विशेष सतर्कता बरतने का निर्णय डीआरडीओ ने लिया है।

अगर तूफान का असर ज्यादा दिखा तो डीआरडीओ भर्ती मरीजों को बीएचयू सुपरस्पेशियलिटी ब्लॉक में शिफ्ट किया जा सकता है। डीआरडीओ अधिकारियों ने इसके लिए बीएचयू अस्पताल के एमएस से मुलाकात भी की, जिसके बाद बीएचयू में भी इसके मददेनजर तैयारियां तेज हो गई हैं।

बीएचयू एंफीथिएटर मैदान पर डीआरडीओ द्वारा बनाए गए 750 बेड के अस्थायी अस्पताल में आईसीयू में 250 मरीजों के भर्ती करने की सुविधा शुरू की गई है। वर्तमान समय में यहा 115 मरीज भर्ती हैं। जिस तरह से चक्रवाती तूफान यास को लेकर मौसम विभाग ने वाराणसी समेत आसपास के जिलों में भी तेज हवा के साथ झमाझम बारिश की संभावना जताई है।

उसको देखते हुए अब डीआरडीओ में भी भर्ती मरीजों के इलाज को लेकर भी विशेष सतर्कता बरती जा रही है। इसके लिए डीआरडीओ के अधिकारियों ने बीएचयू अस्पताल के एमएस से बातचीत कर तैयारियां शुरू कर दी हैं जिससे कि जरूरत पड़ने पर मरीजों को शिफ्ट करने में और उनका इलाज करने में कोई परेशानी ना हो। 346 बेड वाले बीएचयू के सुपरस्पेशियलिटी ब्लॉक में अभी भी 200 से ज्यादा बेड खाली हैं।

बीएचयू अस्पताल के एमएस प्रो. केके गुप्ता ने बताया कि डीआरडीओ अस्पताल के ब्रिगेडियर एस बावेजा समेत अन्य अधिकारियों ने तूफान यास को देखते हुए जरूरत पड़ने पर डीआरडीओ से मरीजों को बीएचयू में शिफ्ट करने की बात की है। बातचीत के बाद बीएचयू सुपरस्पेशियलिटी ब्लॉक में तैयारियां शुरू करा दी गई हैं, जिससे जरूरत पड़ने पर कोई परेशानी न हो।

<https://www.amarujala.com/uttar-pradesh/varanasi/cyclone-yaas-corona-patients-shift-from-bhu-temporary-hospital?pageId=1>



काशी हिंदू विश्वविद्यालय। - फोटो : अमर उजाला।

Assam Chief Minister praises DRDO Scientist for developing anti-covid drug

The Chief Minister said that her initiative will be "very critical in empowering our fight against COVID-19"

By Ratnadip Choudhury

Guwahati: Assam Chief Minister Himanta Biswa Sarma congratulated Dr Jubilee Purkayastha, a scientist with the Institute of Nuclear Medicine and Allied Sciences, for her outstanding contributions in the development of an anti-Covid drug.

In a congratulatory letter to Dr Purkayastha on Wednesday, Mr Sarma, said, "Assam is really proud of you for your role in several scientific forums of the country. Your association with DRDO (Defence Research and Development Organisation) and your role as an active member of the team that developed the drug 2-DG is your sacred privilege."



Himanta Biswa Sarma said India is typically poised to offer much to the world (File)

The Chief Minister said that her initiative will be "very critical in empowering our fight against COVID-19".

Congratulating Dr Purkayastha on her achievement, the Chief Minister said, "I thank you for your crucial role in research and development and hope that you will continue your services to bring many more laurels to our state."

The Chief Minister also said that India is blessed with a young population brimming with new ideas, innovations and opportunities. "With its rich human resources, our country is typically poised to offer much to the world. The qualitative changes that our nation has witnessed in the past few years have been really praiseworthy. Innovation will drive our future and we are working dedicatedly to make our country an innovation hub," he said.

Dr Purkayastha is a native of a nondescript village Mahishashan in South Assam's Karimganj district.

<https://www.ndtv.com/india-news/assam-chief-minister-praises-drdo-scientist-for-developing-anti-covid-drug-2449995>

ThePrint

Thu, 27 May 2021

Indian Army will soon get 4 Heron TP drones on lease from Israel, plans to deploy them at LAC

Heron TP is as long as a Rafale and has twice its wingspan. It is the latest generation of Heron MALE UAV systems that Army and IAF already operate

By Snehesh Alex Philip, Edited by Shreyas Sharma

New Delhi: The Indian Army will soon get four Heron TP drones on lease from Israel, which will be deployed along the Line of Actual Control with China for long surveillance missions, ThePrint has learnt.

The Heron TP, which is as long as a Rafale (14 metres) and has double the wingspan of the French fighter, has been developed by Israel Aerospace Industries (IAI). It is a Medium Altitude Long Endurance (MALE) Unmanned Aerial System (UAS) for all weather strategic missions. While the Heron TP drones are capable of being armed if needed, sources said the ones being leased by India are non-weaponised versions.



The Heron TP drone is manufactured by Israel Aerospace Industries | Photo: iai.co.il

“The first two drones will be delivered soon. The other two will be delivered after a gap of three months,” a source told ThePrint, adding that the contract for the lease was signed earlier this year. The lease is for a period of three years with an option of another two years, but costs are not being divulged.

Army’s first lease of equipment

This is the Indian Army’s first time leasing military equipment, after a clause was introduced in the latest version of the Defence Acquisition Procedure. The Navy has already leased two non-weaponised General Atomics Aeronautical Systems MQ-9B Sea Guardian MALE UAVs from the US under this policy, but sources in the defence establishment said that the Israeli Heron TP performs better and is cheaper.

The Army and the Indian Air Force use a mix of previous generation Heron and Searcher 2 drones. Sources said that the Heron TP is much more capable than its predecessor.

“The Heron TP is huge. It looks like an AN-32 aircraft in size because of its large wingspan. It has a maximum take-off weight of 5,670 kg, with a maximum payload weight of 2,700 kg. The earlier generation has less than half this capacity,” a source said, adding that with an endurance of 30 hours, the drone has a range of over 1,000 kilometres.

It is equipped with automatic taxi-takeoff and landing (ATOL), satellite communication for extended range, and fully redundant avionics, among other highlights.

Meanwhile, the armed forces are in talks with Israel to upgrade the 90 previous generation Herons in service, and also to weaponise them. Of the 90, about 75 are operated by the IAF.

<https://theprint.in/defence/indian-army-will-soon-get-4-heron-tp-drones-on-lease-from-israel-plans-to-deploy-them-at-lac/665981/>

Won't be long before a woman commands a warship, say female Navy officers deployed at sea

Surg. Lt Hannah Jane and Lt Cdr Tanisha Chakraborty are among four women officers deployed aboard warships in December-January. They are serving on fleet tanker INS Shakti

By Amrita Nayak Dutta, Edited by Shreyas Sharma

New Delhi: The Indian Navy will soon see a marked rise in the number of women deployed on-board warships, and in future, they may command a warship too, two female naval officers recently deployed aboard a warship told ThePrint in an interview.

Surgeon Lieutenant T. Hannah Jane and Lieutenant Commander Tanisha Chakraborty are serving aboard fleet tanker INS Shakti. They are two of the four women officers deployed by the Navy aboard warships in December-January, after a gap of nearly 25 years. The others are Lt Sivi Bhardwaj, an air traffic controller, and Lt Cdr Priyanka Chaudhary, a logistics officer. Both have been deployed on India's only aircraft carrier INS Vikramaditya.



Surgeon Lieutenant T. Hannah Jane and Lieutenant Commander Tanisha Chakraborty have been deployed on board fleet tanker INS Shakti | By special arrangement

Back in 1997, the first women officers to be posted aboard warships were Surgeon Commander Vinita Tomar and Sub Lieutenant Rajeshwari Kori on INS Jyoti, a fleet support vessel. However, no women officers were permitted on corvettes, destroyers and aircraft carriers. Women do not serve as sailors in the Indian Navy.

Barring the medical wing, 704 women are currently serving in the Navy, which is 6.5 per cent of the total officer cadre, according to data submitted in Parliament. The total strength of men serving in the Navy is 10,108.

Surg. Lt Hannah Jane, a naval doctor, told ThePrint that women have always had marginal relevance in the armed forces, but now, people are being more receptive to change and their number is slowly increasing.

“Women have always aspired to be on warships but due to difficult habitability conditions for women on board, there has been a delay in enforcing it,” she said.

“Now, the Navy is working towards ensuring enhancement of living conditions in order to suit the requirement of women on ships, and I'm sure we will see a marked rise in the number of women on board ships,” said Jane, who is on temporary Covid-19 duty at the Dhanvantri Covid Care Hospital set up in Ahmedabad under the aegis of the Defence Research and Development Organisation.

Lt Cdr Chakraborty, a logistics officer, added that the environment aboard the ship has been quite conducive. “With the worldwide change in perception of gender, accessibility to social media and acceptance of women in leadership roles, society has evolved very much and so has the Indian Navy,” she said. “As a matter of fact, the environment has been quite conducive,” Chakraborty continued, adding that the existing infrastructure of most ships is being reviewed to see which are habitable for women, and changes are being made to ships currently under construction.

Armed forces kid and civilian, both driven by adventure

Surg. Lt Hannah Jane hails from Cuddalore in Tamil Nadu, and her mother is a serving Nursing Officer in the armed forces. “So, I grew up all across the country due to her frequent transfers,” she said.

Jane attended the Army Public Schools and Kendriya Vidyalayas all around the country, and completed her MBBS from Rajah Muthiah Medical College in Tamil Nadu.

She said it was her mother who inspired her to join Indian Navy in June 2017, though she was already fascinated by the uniform, the adventurous lifestyle and the “opportunities provided by the services to broaden the horizon of an individual”.

Lt Cdr Chakraborty, meanwhile, was born in Guwahati, Assam, but travelled to different parts of the country while growing up as her father had a transferrable job. She graduated in engineering from Chennai, and joined the armed forces after working with firms like Wipro and Huawei.

Chakraborty said when she joined the Indian Navy in July 2009, there wasn't much exposure to the defence forces for people like her, who hail from civilian backgrounds.

“I had come across an advertisement in the print media for joining the forces. The sheer passion for adventure drove me to apply for the services. Today, when I look back, I am happy I took the call and I am proud to don the uniform,” she said.

Commanding a ship & permanent commission

Serving at sea is considered an important milestone in the career growth of naval officers, and posting women officers on board warships as well as giving them permanent commission opens doors for senior select rank promotions for them in the service, for which they were not considered earlier.

Lt Cdr Chakraborty said with this new trend, she definitely sees women officers commanding ships in the future.

“It doesn't seem to be a far-flung idea anymore to see women officers commanding ships in the future,” she said.

Surg. Lt Hannah Jane agreed, but said there is a long way to go as their male counterparts get a larger amount of training and experience.

Speaking about the Supreme Court's 2020 judgment on granting permanent commission to women Navy officers, Hannah Jane said it is encouraging, and will help put women at par with men and inspire more women to join the Navy.

Chakraborty concurred: “I am sure this will encourage more women officers to join the armed forces. Being a short service commissioned officer, one has to start thinking of a second career on the verge of one's thirties. A stable job with the permanent commission is definitely going to be a boost. Opportunities are increasing to spread wings every day.”

Challenges for women aboard a ship

Women officers in the Indian Navy work in different branches such as logistics, education, aviation and naval architecture, among others. They also serve in operational appointments as ‘observers’ in the Navy's maritime reconnaissance aircraft like P8i, IL-38 and Dornier.

In September last year, the Navy cleared the way for two women officers — Sub Lieutenants Riti Singh & Kumudini Tyagi — to operate from the deck of a warship as helicopter observers.

“In future, I envisage women sailors working hand-in-hand with male sailors in fields like discipline, logistics, education and medical,” Lt Cdr Chakraborty said.

Surg Lt Hannah Jane added that at the beginning of her deployment on board a ship, she had some mental inhibitions, but as she got exposed to the environment, she found it was no different from the base units.

Chakraborty, who has been stationed aboard INS Shakti for about a couple of months now, said work-wise, the experience isn't much different.

“I am learning the nuances of the unique circumstances on board, as against being in ashore units. Other trivial challenges are like living in no network areas and reduced interactions with family due to long or unpredictable sailing schedules,” she said.

<https://theprint.in/defence/wont-be-long-before-a-woman-commands-a-warship-say-female-navy-officers-deployed-at-sea/665218/>

Thu, 27 May 2021

Novel heterostructure nanosheet boosts efficiency of lean-electrolyte lithium batteries

By Li Yuan

Lithium sulfur (Li-S) battery technology is promising for next-generation energy storage. However, lithium polysulfide shuttling, sluggish redox kinetics, and uncontrollable lithium dendrite growth limit the cycling stability.

A research group led by Prof. Wu Zhongshuai from the Dalian Institute of Chemical Physics (DICP) of the Chinese Academy of Sciences developed niobium (V)-based heterostructure nanosheet for polysulfides-suppressed sulfur cathodes and dendrite-free lithium anodes in long-cycling and lean-electrolyte Li-S batteries.

This study was published in *Advanced Functional Materials*.

"We developed a twinborn holey $\text{Nb}_4\text{N}_5\text{-Nb}_2\text{O}_5$ heterostructure, serving as dual-functional host for both redox-kinetics-accelerated sulfur cathode and dendrite-inhibited lithium anode simultaneously," said Prof. Wu.

Polysulfide-shuttling was alleviated due to the accelerative polysulfides anchoring-diffusion-converting efficiency of $\text{Nb}_4\text{N}_5\text{-Nb}_2\text{O}_5$. Meanwhile, the researchers applied lithiophilic nature of holey $\text{Nb}_4\text{N}_5\text{-Nb}_2\text{O}_5$ as an ion-redistributor for homogeneous Li-ion deposition.

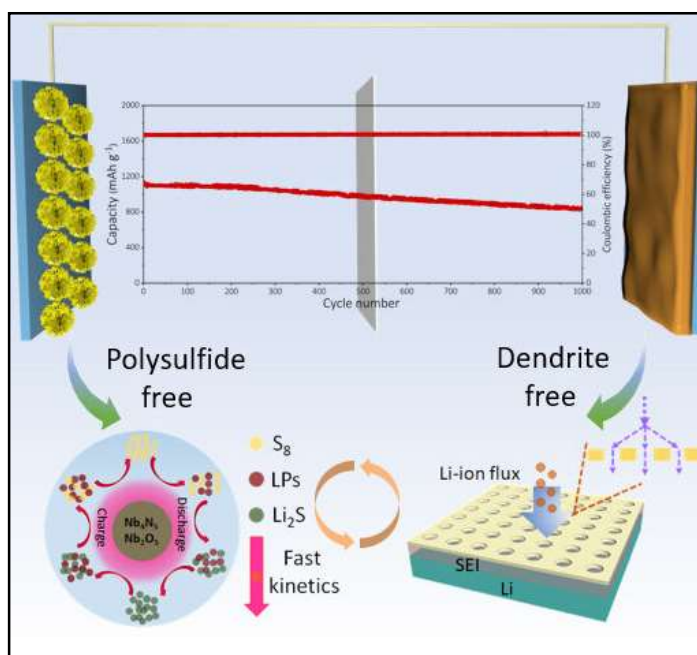
The Li-S full battery presented a high areal capacity of 5.0 mAh cm^{-2} at sulfur loading of 6.9 mg cm^{-2} , corresponding to negative to positive capacity ratio of 2.4:1 and electrolyte to sulfur ratio of $5.1 \text{ } \mu\text{L mg}^{-1}$.

This work paves a new avenue for boosting high-performance Li-S batteries toward practical applications.

More information: Haodong Shi et al, Interfacial Engineering of Bifunctional Niobium (V)-Based Heterostructure Nanosheet Toward High Efficiency Lean-Electrolyte Lithium-Sulfur Full Batteries, *Advanced Functional Materials* (2021). DOI: [10.1002/adfm.202102314](https://doi.org/10.1002/adfm.202102314)

Journal information: [Advanced Functional Materials](https://doi.org/10.1002/adfm.202102314)

<https://phys.org/news/2021-05-heterostructure-nanosheet-boosts-efficiency-lean-electrolyte.html>



chematic of bifunctional niobium (V)-based heterostructure nanosheet toward high efficiency lean-electrolyte lithium-sulfur full batteries. Credit: SHI Haodong

Laser-driven ion acceleration with deep learning

By Michael Padilla

While advances in machine learning over the past decade have made significant impacts in applications such as image classification, natural language processing and pattern recognition, scientific endeavors have only just begun to leverage this technology. This is most notable in processing large quantities of data from experiments.

Research conducted at Lawrence Livermore National Laboratory (LLNL) is the first to apply neural networks to the study of high-intensity short-pulse laser-plasma acceleration, specifically for ion acceleration from solid targets. While in most instances of neural networks they are used primarily for studying datasets, in this work the team uses them to explore sparsely sampled parameter space as a surrogate for a full simulation or experiment.

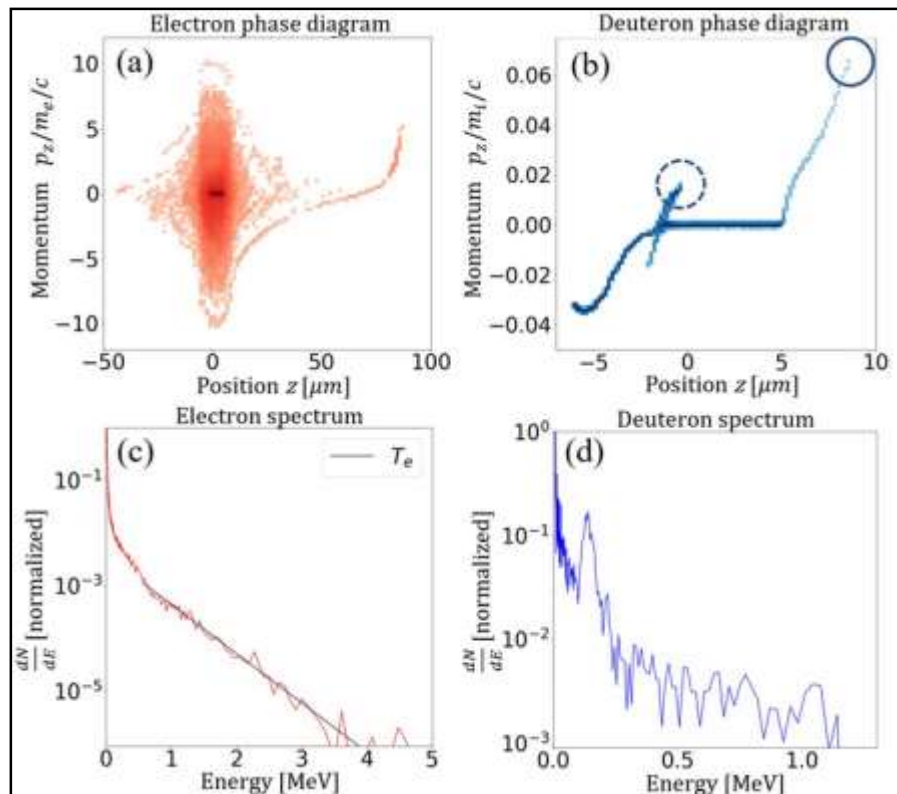
The research is featured in Physics of Plasma and is highlighted as an Editor's Pick. LLNL postdoctoral appointee Blagoje Djordjević is lead author and co-authors include

Andreas Kemp, Joohwan Kim, Scott Wilks, Tammy Ma and Derek Mariscal, as well as Raspberry Simpson from the Massachusetts Institute of Technology. The work was funded under a Laboratory Directed Research & Development (LDRD) project and a Department of Energy grant.

"The work primarily serves as a simple demonstration of how we can use machine learning techniques such as neural networks to augment the tools we already have," Djordjević said. "Computationally expensive simulations such as particle-in-cell codes will remain a necessary aspect of our work, but with even a simple network we are able to train a surrogate model that can reliably fill out interesting swaths of phase space."

Djordjević generated an ensemble of more than 1,000 particle-in-cell simulations using the EPOCH code. This dataset encompassed a wide range of experimental parameters of interest that covered several orders of magnitude. This dataset, from which he extracted physical parameters of interest such as the ion energy, E_i and electron temperature, T_e , was then used to train a multilayer, fully connected neural network.

The trained neural network acted as a surrogate model to explore the parameter space of interest, in particular for feature discovery. It was demonstrated how the neural network could be used to



Data extracted from the simulation ensemble to train the neural network. Shown are the phase space diagrams for (a) the electrons and (b) the deuterons at 500 fs as well as the corresponding energy spectra in (c) and (d). In particular we focused on two scalars as figures-of-merit, the peak ion energy E_i circled in (b) and the hot electron temperature T_e shown in (c). Credit: Lawrence Livermore National Laboratory

rapidly explore this space, mapping the dependency of ion energy on laser intensity and pulse duration τ over several orders of magnitude.

The surrogate also was used to discover an interesting behavior in the dependency on preplasma gradient length scale L_g and this quantity was further explored using more elaborate techniques such as ensemble surrogates and transfer learning. The accelerated ion energy depends nonlinearly on the profile of the underdense preplasma the laser interacts with before it hits the main target. While one could expect to find a resonance value near the relativistic plasma skin depth, it was notable that the network was able to reliably generate this result despite the sparsity of data. Lastly, as a proof of concept, it was shown how the surrogate could be used to extract important physical information from experimental data that is difficult to observe directly, such as the gradient length scale.

"Using a sparse but broad dataset of simulations, we were able to train a neural network to reliably reproduce the trained results as well as generate results for unsampled regions of parameter space with reasonable confidence, Djordjević said. "This resulted in a surrogate model, which we used to rapidly explore regions of interest."

Derek Mariscal, who serves as Djordjević's mentor, said the work outlines a completely new approach to the way the physics of short-pulse high-intensity laser interactions are studied. Machine learning approaches are now being widely adopted in the sciences and this is a foundationally important step forward in developing high-speed, high-accuracy high-energy density science.

Mariscal said most short-pulse laser experiments over the past 20 years have assumed that the delivered laser pulses were essentially Gaussian in shape, but this is largely an unvalidated assumption.

"The LDRD project is aimed at delivering tailored sources from shaped high-intensity laser short-pulses while paying close attention to the as-delivered laser pulses," he said. "We have found through modeling and a limited set of experiments that these pulse details can have a profound impact on the resulting electron and ion sources."

Fundamentally, high energy (keV-to-MeV) electrons are pushed by the laser interacting with target, and these electrons can be used to accelerate protons, heavy ions or produce bright X-ray sources. Since there is a nearly infinite set of possible laser pulse shapes, there is an extremely broad parameter space to examine through either experiments or simulations.

"The technique of performing simulation parameter scans is not novel; however, the power of machine learning is in interpolating between the sparsely spaced points," Mariscal said. "This is a massive savings in computation power because simulations of this nature can be very expensive."

Djordjević said the research verifies the approach of using machine learning to explore physics of interest by leveraging relatively low-cost simulation ensembles to cover as much ground as possible.

Work continues

Immediate application of the work will benefit two LLNL projects, an LDRD project led by Mariscal, where large ensembles will be used to model the dependency of ion acceleration on shaped laser pulses, and a project led by LLNL physicists Tammy Ma and Timo Bremer where these ensembles will be used to train neural networks for virtual diagnostics and operations control.

Laser-plasma acceleration already has an important application for the inertial confinement fusion mission as the National Ignition Facility (NIF) uses relatively short, picosecond-long laser pulses to accelerate hot electrons, which in turn generate X-rays for imaging the capsule implosion at the center of NIF.

"In our immediate future we will be generating a new set of simulations to support two experiments our team will be fielding this summer on high-repetition-rate laser systems," Djordjević said. "The most important aspect of this project is that we will be shaping short, femtosecond-scale laser pulses, where NIF's lasers are shaped on the nanosecond scale. This will require us to run even more simulations where we not only vary standard parameters such as target

foil thickness and laser intensity and duration, but also spectral phase contributions to the laser profile."

More information: B. Z. Djordjević et al, Modeling laser-driven ion acceleration with deep learning, *Physics of Plasmas* (2021). DOI: [10.1063/5.0045449](https://doi.org/10.1063/5.0045449)

Journal information: *Physics of Plasmas*

<https://phys.org/news/2021-05-laser-driven-ion-deep.html>



Thu, 27 May 2021

Light-emitting MXene quantum dots

By Compuscript Ltd

In a new publication from *Opto-Electronic Advances*, researchers led by Professor Jeongyong Kim at the Department of Energy Science, Sungkyunkwan University, Suwon, Republic of Korea, review light-emitting MXene quantum dots.

MXenes have found wide-ranging applications in energy storage devices, sensors and catalysis, owing to their high electronic conductivity and wide range of optical absorption. However, the absence of semiconducting MXenes has limited their applications related to light emission.

Extensively reviewing current relevant research, the authors summarize recent advances in MXene quantum dot (MQD) research on the synthesis, optical properties and applications of MQDs as light emitting quantum materials. Research has shown that quantum dots (QDs) derived from MXene (MQDs) not only retain the properties of the parent MXene but also demonstrate significant improvement on light emission and quantum yield.

The authors provide an overview of light emitting MQDs and their synthesis methods, optical properties, and applications in various optical, sensory, and imaging devices. Future prospects for light emitting MQDs are also discussed to provide insight to help further advance research.

More information: Anir S. Sharbirin et al, Light-emitting MXene quantum dots, *Opto-Electronic Advances* (2021). DOI: [10.29026/oea.2021.200077](https://doi.org/10.29026/oea.2021.200077)

<https://phys.org/news/2021-05-light-emitting-mxene-quantum-dots.html>

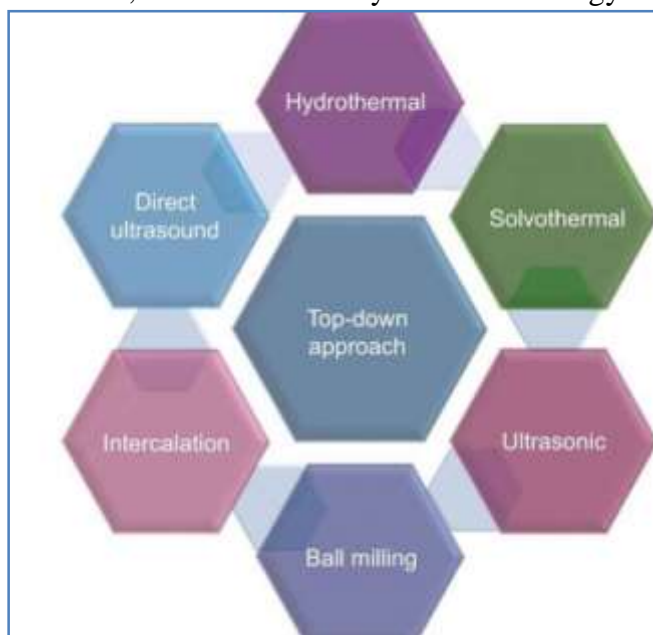


Figure 1. Top-down approaches for MQD synthesis.

Thu, 27 May 2021

UK study finds long-term lung damage after COVID-19

Researchers in the UK have identified persistent damage to lungs in COVID-19 patients at least three months after they were discharged from hospital, and in some cases the duration is even longer

Researchers in the UK have identified persistent damage to lungs in COVID-19 patients at least three months after they were discharged from hospital, and in some cases the duration is even longer. The study, conducted by Sheffield and Oxford researchers using a cutting-edge method of imaging, said the damage was not detected by routine CT scans and clinical tests, and the patients would consequently normally be told their lungs are normal.

Early research by the team has shown that patients who have not been hospitalised with COVID-19 but who are experiencing long-term breathlessness may have similar damage in their lungs, and a larger study is needed to confirm this, a release by the Sheffield University said on Wednesday.

In a paper published in *Radiology*, the world's leading radiology journal, the researchers from the University of Sheffield and the University of Oxford said that hyperpolarised xenon MRI (XeMRI) scans

had found abnormalities in the lungs of some COVID-19 patients more than three months; and in some cases, nine months – after leaving hospital, when other clinical measurements were normal.

Lead author of the study, Professor Jim Wild, Head of Imaging and NIHR Research Professor of Magnetic Resonance at the University of Sheffield, said, the findings of the study are very interesting. The ¹²⁹Xe MRI is pinpointing the parts of the lung where the physiology of oxygen uptake is impaired due to long standing effects of COVID-19 on the lungs, even though they often look normal on CT scans.

“It is great to see the imaging technology we have developed rolled out in other clinical centres, working with our collaborators in Oxford on such a timely and clinically important study sets a real precedent for multi-centre research and NHS diagnostic scanning with ¹²⁹Xe MRI in the UK,” the release quoted him as saying.

The study's Principal Investigator Professor Fergus Gleeson, Professor of Radiology at the University of Oxford and Consultant Radiologist at Oxford University Hospitals (OUH) NHS Foundation Trust, said: Many COVID-19 patients are still experiencing breathlessness several months after being discharged from hospital, despite their CT scans indicating that their lungs are functioning normally.



Early research by the team has shown that patients who have not been hospitalised with COVID-19 but who are experiencing long-term breathlessness may have similar damage in their lungs. (IE Image)

“Our follow-up scans using hyperpolarised xenon MRI have found that abnormalities not normally visible on regular scans are indeed present, and these abnormalities are preventing oxygen getting into the bloodstream as it should in all parts of the lungs.”

The study, which is supported by the NIHR Oxford Biomedical Research Centre (BRC), has now begun testing patients who were not hospitalised with COVID-19 but who have been attending long COVID clinics.

“Although we are currently only talking about early findings, the XeMRI scans of non-hospitalised patients who are breathless – and 70 per cent of our local patients with Long COVID do experience breathlessness “may have similar abnormalities in their lungs. We need a larger study to identify how common this is and how long it will take to get better,” Prof Gleeson explained.

“We have some way to go before fully comprehending the nature of the lung impairment that follows a COVID-19 infection. But these findings, which are the product of a clinical-academic collaboration between Oxford and Sheffield, are an important step on the path to understanding the biological basis of long COVID and that in turn will help us to develop more effective therapies,” Gleeson said.

The Pulmonary, Lung and Respiratory Imaging Sheffield (POLARIS) research group led by Professor Jim Wild at the University of Sheffield pioneered the methods, development and clinical applications of hyperpolarised gas lung MRI in the UK, performing the first clinical research studies in the UK and the world’s first clinical diagnostic scanning with this technology.

<https://www.financialexpress.com/lifestyle/health/uk-study-finds-long-term-lung-damage-after-covid-19/2259476/>

