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समाचार पत्रों से चयित अंश Newspapers Clippings

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COVID 19: DRDO's Contribution

Tue, 25 May 2021

Centre approves 2 PSA Oxygen plant in Arunachal Pradesh

The plants would be set by DRDO at Tomo Riba Institute of Health and Medical Sciences (TRIHMS) at Naharlagun and Tenga under PM Cares Fund.

Itanagar: The Union Health and Family Welfare Ministry has approved the setting up of two pressure swing adsorption (PSA) oxygen plants in Arunachal Pradesh.

The plants would be set by DRDO at Tomo Riba Institute of Health and Medical Sciences (TRIHMS) at Naharlagun near here, and Tenga in West Kameng district, under PM Cares Fund, official sources said here on Monday.

"In a big boost to Arunachal's fight against #CoronaPandemic, @MoHFW_INDIA has approved for setting up of PSA oxygen plants at TRIHMS, Naharlagun & Tenga in West Kameng district to be setup by @DRDO_India under #PMCareFund.

This will help augment oxygen supply for covid patients," Chief Minister Pema Khandu tweeted.

The northeastern state on Saturday received a consignment of 150 oxygen concentrators from the World Health Organisation (WHO) with capacity up to 8 litres per minute.

State Health and Family Welfare Minister Alo Libang received the consignment in presence of Principal Secretary (Health) Dr Sharat Chauhan and other officers of the department.

"The @WHO is supporting India in filling critical gaps in the availability of Oxygen.

To help Arunachal deal with the #CoronaPandemic, the WHO provided 150 oxygen concentrators for the State, which was received by Health Minister @libang_alo," Khandu said in another tweet.

Libang informed that portable oxygen concentrators would be distributed to remote hospitals of various districts in the state.

"More oxygen generator plants are to be established in various district and state capital under PM-Cares fund and also with the help of other NGOs," Libang said, adding, the state government is taking all steps to ensure adequate oxygen supply in the state.

"We are preparing ourselves to fight the virus.

We have now more than 300 oxygen beds and we plan to have 500 at the Dedicated Covid Hospital (DCH) Chimpu besides more ICU beds," the minister added.

<https://www.newindianexpress.com/nation/2021/may/24/centre-approves-2-psa-oxygen-plant-in-arunachal-pradesh-2306844.html>



Image for representation (Photo | Express)

Possible third wave of Covid: Dhanvantari hospital in Ahmedabad to train its medical officers

Divided into three levels, the week-long training will be provided in batches to over 200 MBBS doctors who would be specifically trained in ICU management and intensive care of Covid patients

Ahmedabad: Taking lessons from the second wave of Covid-19 pandemic in preparing for a possible third wave, the 900-bed Dhanvantari Covid Hospital in Ahmedabad run by the Defence Research and Development Organisation (DRDO) and the Gujarat University (GU) launched a “Covid Advanced” training module for its medical officers (MO) on Monday.

Divided into three levels, the week-long training will be provided in batches to over 200 MBBS doctors who would be specifically trained in ICU management and intensive care of Covid patients. The training will be given by 50 specialist doctors and consultants from BJ Medical College and Hospital and DRDO along with private superspecialists.



The training will be given by 50 specialist doctors and consultants from BJ Medical College and Hospital and DRDO along with private superspecialists.

The specialists team include Dr Sapan Pandya, Dr Tushar Patel, Dr Atul Patel and Dr Parthiv Mehta. Management of paediatric and gynaecology and obstetrics related case management are also part of the module.

“As there are predictions of third wave of Covid pandemic and there are continuous additions in associated complications and treatment protocols, the training is aimed at creating a workforce of Covid management specialists,” said principal secretary education Anju Sharma who is managing the Dhanvantari Covid Hospital.

In the seven-day training, two hours will be theory and the remaining hours will be spent in the ICU. Total duration of level one training will be 50 hours, which will be completed in seven days. At the end of level one, an evaluation will be done and best one will be chosen for level two and level three training.

Dr Kamlesh Upadhyay from BJ Medical College Department of Medicine said that the training has been organised keeping in view all the challenges faced in the second wave of the pandemic.

“We are aiming at training the medical officers in such a manner that each of the MO is able to manage one Covid hospital. This will prepare a team of 200 doctors who will be well prepared... It is also aimed at optimising use of available resources such as oxygen and drugs...,” Dr Upadhyay said.

A certificate will be issued to the trained doctors, said Himanshu Pandya Vice-Chancellor of Gujarat University. “We are preparing our doctors for any sort of emergency... With the experience during the second wave, we have realised that MBBS doctors are not equipped to handle the issues arising out of Covid,” Pandya said.

<https://indianexpress.com/article/cities/ahmedabad/possible-third-wave-of-covid-dhanvantari-hospital-in-ahmedabad-to-train-its-medical-officers-7328985/>

उपलब्धि: डीआरडीओ ने ऋषिकेश में 500 बेड का कोविड केयर अस्पताल किया तैयार

कोरोना वायरस संक्रमण के चलते अस्पतालों में बेड तथा ऑक्सीजन की किल्लत के बीच राहत देने वाली खबर यह है कि ऋषिकेश में रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) ने 500 बेड का कोविड अस्पताल तैयार कर दिया है। इस कोविड अस्पताल का संचालन एम्स ऋषिकेश करेगा।

By Sunil Negi

ऋषिकेश: कोरोना वायरस संक्रमण के चलते अस्पतालों में बेड तथा ऑक्सीजन की किल्लत के बीच राहत देने वाली खबर यह है कि ऋषिकेश में रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) ने 500 बेड का कोविड अस्पताल तैयार कर दिया है। इस कोविड अस्पताल का संचालन एम्स ऋषिकेश करेगा। डीआरडीओ ने महज तीन सप्ताह में इस अस्पताल को तैयार किया है।

कोरोना वायरस संक्रमण की दूसरी लहर पूरे देश में बेहद घातक रूप से फैली। स्थिति इस कदर बिगड़ गई कि अस्पतालों में मरीजों के लिए बेड कम पड़ गए। अस्पतालों में जगह न मिलने तथा ऑक्सीजन की कमी के चलते कई मरीजों ने दम तोड़ दिया। इस स्थिति को नियंत्रण करने के लिए रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) आगे आया। डीआरडीओ ने देशभर में कई जगह अस्थाई कोविड अस्पताल बनाने शुरू किए। उत्तराखंड में भी ऋषिकेश तथा हल्द्वानी में डीआरडीओ को 500-500 बेड के दो अस्पताल तैयार करने की अहम जिम्मेदारी दी गई थी।



ऋषिकेश के आईडीपीएल में डीआरडीओ ने इसी माह तीन मई को कोविड अस्पताल तैयार करने का काम शुरू किया था। बेहद तेजी के साथ डीआरडीओ ने इस काम को अंजाम दिया। डीआरडीओ के साथ ही स्थानीय स्तर पर ऊर्जा निगम, जल संस्थान तथा लोक निर्माण विभाग ने भी रिकॉर्ड समय में यहां आधारभूत सुविधाएं जुटाने में महत्वपूर्ण योगदान दिया। डीआरडीओ ने इस कोविड अस्पताल के निर्माण में दिन-रात एक कर दिए। आखिर महज तीन सप्ताह में डीआरडीओ ने 500 बेड का यह कोविड अस्पताल तैयार कर अपनी अहमियत साबित की है। अस्पताल तैयार होने के बाद अब एम्स प्रशासन ने यहां चिकित्सक, नर्स तथा अन्य स्टाफ की तैनाती शुरू कर दी है। मंगलवार से इस कोविड अस्पताल को विधिवत शुरू कर दिया जाएगा। डीआरडीओ के चीफ कंस्ट्रक्शन गगन भादवा ने बताया कि आईडीपीएल ऋषिकेश का कोविड अस्पताल तैयार हो चुका है, जिसे एम्स ऋषिकेश को संचालन के लिए सौंपने की प्रक्रिया जारी है।

कोविड अस्पताल में 200-200 बेड के दो सेक्शन

कोविड अस्पताल में 200-200 बेड के दो अलग-अलग सेक्शन बनाए गए हैं। यह सभी 400 बेड ऑक्सीजन प्रणाली से जुड़े हुए हैं, जबकि इस कोविड अस्पताल के तहत वेंटिलेटर युक्त 100 बेड एम्स ऋषिकेश परिसर में ही बढ़ाए गए हैं। यानी ऑक्सीजन आवश्यकता वाले कोरोना संक्रमित मरीजों को

आईडीपीएल के कोविड अस्पताल में भर्ती किया जाएगा। जबकि वेंटिलेटर की आवश्यकता वाले मरीजों को एम्स ऋषिकेश में ही भर्ती किया जाएगा।

शहीद जसवंत सिंह रावत को समर्पित किया कोविड अस्पताल

डीआरडीओ ने ऋषिकेश के आईडीपीएल में तैयार किए गए 500 बेड के कोविड अस्पताल को अमर शहीद जसवंत सिंह रावत को समर्पित किया है। इस अस्पताल का नाम राइफलमैन जसवंत सिंह रावत कोविड केयर सेंटर ऋषिकेश रखा गया है। राइफलमैन जसवंत सिंह रावत भारतीय सेना के गौरव हैं। मूल रूप से उत्तराखंड के पौड़ी गढ़वाल निवासी जसवंत सिंह रावत गढ़वाल राइफल्स की चौथी बटालियन में सेवारत थे। उन्होंने 1962 के भारत-चीन युद्ध के दौरान अरुणाचल प्रदेश के तवांग के नूरारंग की लड़ाई में अहम भूमिका निभाई थी।

<https://www.jagran.com/uttarakhand/dehradun-city-drdo-prepares-500-bed-covid-care-hospital-in-rishikesh-21672228.html>



Tue, 25 May 2021

MP: DRDO 2DG dose becomes 'Sanjeevani' for Corona infected woman

By Muskan

Indore: While the corona epidemic continues to wreak havoc across the country, scientists and doctors have not been able to find a permanent cure so far. Plasma therapy and remdesivir have also been removed from the list of corona virus treatments by the World Health Organization (WHO), which was considered 'life-saving' in corona until a few days ago. Corona Medicine 2-DG of the Indian Defence Research and Development Organisation (DRDO) has become a ray of hope.



This medicine of DRDO is showing very positive results. A similar case has come to light from CHL Hospital in Indore, Madhya Pradesh, where a woman undergoing corona treatment has benefited greatly from the 2-DG of DRDO.

In fact, Santosh Goyal CHL hospital is undergoing treatment in non-covid ward of Indore. She is a post covid patient whose oxygen level was continuously falling. After which he has been given the first dose of DRDO as 2-DG sachet on Sunday. Her health has improved very well only after taking the first dose.

The lady feels humbled and grateful for the efforts of Prime Minister, Shri Narendra Modi ji and the scientists of the DRDO.

The trial of 2-DG medicine has revealed that the drug is safe for COVID patients and also helps a lot in recovery. After positive results, DCGI approved the Phase III trial in November 2020. Finally, on 9th May, 2021, based on trial data, the DCGI allowed emergency use of the drug.



<https://english.newstracklive.com/news/madhya-pradesh-indore-shrimati-santosh-goyal-get-relief-in-corona-after-taking-drdo-2dg-medicine-mc23-nu764-ta321-1161797-1.html>

Tue, 25 May 2021

Recruitment of contractual staff for DRDO-Hospital being ensured on time: GMC Jammu

Jammu: The administration of Government Medical College Jammu today said that the process for recruitment of the staff on contractual basis required for early commissioning of DRDO-Hospital has already been initiated and the team will be available by May 26.

Responding to a news report “DRDO Hospital to function from May 25, staff not recruited yet” appearing in a section of press, the authorities stated that that the Government, Vide Order No. 398-JK (HME) of 2021 dated 18.05.2021, has created 683 posts to be deployed in 500 bedded DRDO- COVID Hospital, constructed in collaboration with Defence Research Development Organisation (DRDO) at Bhagwati Nagar Jammu.

“The post of Medical Superintendent and Deputy Medical Superintendent shall be filled-up on deployment basis from the Health Services Department. The post of Physicians, Anesthetists, Pediatricians and Medical Officers shall be filled-up both on deployment from the Health Services Department as well as on contractual basis. The Nursing Staff and Paramedical/Technical Staff shall be filled up both on deployment from Health Services Department as well as on contractual basis” the Medical College Authorities informed.



The GMC authorities said, the process for recruitment of the staff on contractual basis was started with publishing of three advertisements in the leading newspapers of J&K on 20th of May 2021, indicating the designation, number and the eligibility qualification required for the staff to be posted in DRDO Hospital.

“The aspirants of the same were given three day time for filling the forms up to 23rd of May 2021. Accordingly the selection process for the same was completed by 24th of May 2021. As per plan, an orientation programme for newly recruited staff will be held on 25th of May 2021” the GMC authorities said.

As such the staff required for functioning of the DRDO-Hospital shall be readily available by 26 of May 2021, the authorities stated.

<https://www.crosstownnews.in/post/64397/recruitment-of-contractual-staff-for-drdo-hospital-being-ensured-on-time-gmc-jammu.html>

Jammu Kashmir: डीआरडीओ के कोविड अस्पतालों में डॉक्टरों की नियुक्तियां शुरू, यह डॉक्टर होंगे तैनात

जम्मू और श्रीनगर में डीआरडीओ की ओर से बनाए जा रहे 500-500 बिस्तरों की क्षमता वाले कोविड अस्पतालों को जल्दी ही मरीजों के लिए खोल दिया जाएगा। इसके लिए तैयारियां तेजी के साथ चल रही हैं। स्वास्थ्य विभाग से डाक्टरों का तबादला कर एक-एक वर्ष के लिए नियुक्त किया है।

By Vikas Abrol

जम्मू: जम्मू और श्रीनगर में डीआरडीओ की ओर से बनाए जा रहे 500-500 बिस्तरों की क्षमता वाले कोविड अस्पतालों को जल्दी ही मरीजों के लिए खोल दिया जाएगा। इसके लिए तैयारियां तेजी के साथ चल रही हैं। वहीं स्वास्थ्य एवं चिकित्सा शिक्षा विभाग ने दोनों ही अस्पतालों के लिए स्वास्थ्य विभाग से डाक्टरों का तबादला कर उन्हें इन अस्पतालों में एक-एक वर्ष के लिए नियुक्त किया है। जम्मू के अस्पताल में 47 और श्रीनगर के अस्पताल में 56 डाक्टरों को भेजा गया है।



स्वास्थ्य एवं चिकित्सा शिक्षा विभाग के आदेश के जम्मू के भगवती नगर में बने रहे कोविड अस्पताल में पुलिस अस्पताल जम्मू से डा. सुनील कुमार रैना, जिला जेल जम्मू से डा. पिशोरी लाल, हाईकोर्ट जम्मू डिस्पेंसरी से डा. दिनेश कुमार, सीएचसी सुंदरबनी से डा. अब्दुल हमीद, एसडीएच खौंड से डा. विशाली मन्हास, जिला अस्पताल रियासी से डा. बशारत अहमद, सीएचसी चिनैनी से डा. समीर आनंद, ट्रामा अस्पताल म्हानपुर से डा. रवींद्र गुप्ता, बटोत से डा. सीडी थापा, चौकीचोरा से डा. सुमैरा बशीर, सौआंजना से डा. जावेद अख्तर, हीरानगर से डा. भूषण लाल, ज्यौड़ियां से डा. लीला देवी, रामगढ़ से डा. पवन कुमार, घघवाल से डा. हरि कुमारी, कटड़ा से डा. रूमानी, कालाकोट से डा. वसीम को एक साल के लिए तैनात किया है।

इस अस्पताल में कुल सात फिजिशियन, दस एनेस्थीसिया विशेषज्ञ, पांच बाल रोग विशेषज्ञ और 25 मेडिकल आफिसर नियुक्त किए हैं। वहीं श्रीनगर में बने रहे डीआरडीओ के कोविड अस्पताल में आठ एनेस्थीसिया विशेषज्ञ, 11 फिजिशियन, सात बाल रोग विशेषज्ञ और तीस मेडिकल आफिसर नियुक्त किए हैं। सभी को आरंभ में एक साल के लिए इस अस्पताल में नियुक्त किया गया है लेकिन तीन साल तक भी इन्हीं अस्पतालों में उनकी सेवाओं को लिया जा सकता है।

<https://www.jagran.com/jammu-and-kashmir/jammu-doctors-appointments-started-in-dr-dos-covid-care-hospitals-these-doctors-will-be-posted-21673032.html>

Govt deploys 103 docs in COVID hospitals

Jammu: The Government today deployed several doctors in two 500-bedded temporary COVID Hospitals, one each at Jammu and Srinagar, being established in collaboration with DRDO.

According to the Government order, 47 doctors including Consultants Medicine, Consultants/Incharge Consultants Anesthesia, Medical Officers (MOs) and Consultants Pediatrics have been temporarily deployed in 500-bedded temporary COVID Hospital in Jammu.

Likewise, 56 doctors including Consultants Anesthesia, Consultants Medicine, Consultant Surgeon, Consultants Pediatrics and MOs have been deployed in 500-bedded COVID Hospital in Kashmir.

“All these doctors are deemed to have been relieved from their present place of postings and they shall report to the respective Medical Superintendents of these COVID Hospitals for further duties,” the order read.

It further stated that the deployment is temporarily for a period of one year or till the end of the COVID-19 pandemic or till further orders, whichever is earliest.

<https://www.dailyexcelsior.com/govt-deploys-103-docs-in-covid-hospitals/>

अमर उजाला

जम्मू-कश्मीर: डीआरडीओ अस्पताल का कार्य अंतिम चरण में पहुंचा, अगले सप्ताह हो सकता पूरा

सार

जम्मू में डीआरडीओ के कोविड अस्पताल का कार्य अगले सप्ताह में पूरा हो सकता है। 28 मई को ऑक्सीजन फ्लो की टेस्टिंग की जाएगी।

विस्तार

जम्मू के भगवती नगर में बन रहे डीआरडीओ के 500 बेड वाले कोविड अस्पताल का निर्माण कार्य अंतिम चरण में पहुंच गया है। अगले सप्ताह अस्पताल का काम पूरा हो सकता है। इस संबंध में मंडलायुक्त डा राघव लंगर ने निर्माण कार्य स्थल का दौरा कर संबंधित अधिकारियों को तय समयाविधि में अस्पताल का कार्य पूरा करने के निर्देश दिए।

इस अवसर पर उन्हें बताया गया कि अस्पताल में बिजली और पेयजल आपूर्ति दकी व्यवस्था कर दी गई है। आंतरिक ड्रेनेज सिस्टम पर काम किया जा रहा है। डीआरडीओ के अधिकारियों ने मंडलायुक्त को बताया कि ऑक्सीजन के लिए एलएमओ प्लांट को आगामी कुछ दिनों में स्थापित कर दिया जाएगा। 28 मई को ऑक्सीजन फ्लो की टेस्टिंग की जाएगी।

बताया गया कि स्वास्थ्य सेवा निदेशालय की तरफ से



सांकेतिक तस्वीर - फोटो: अमर उजाला

डॉक्टर व पैरा मेडिकल स्टाफ की कुछ व्यवस्था की गई है। अन्य पदों के लिए प्रक्रिया चल रही है। इस अवसर पर नेशनल हेल्थ मिशन के प्रबंध निदेशक यासिन चौधरी, जीएमसी की प्रिंसिपल डा शशि सूदन शर्मा व अन्य अधिकारी भी मौजूद रहे।

<https://www.amarujala.com/jammu/coronavirus-in-jammu-kashmir-work-of-drdo-hospital-jammu-reached-final-stage>



Tue, 25 May 2021

Past use, safety, efficacy: An expert on all you need to know about 2-DG drug in India's Covid fight

The drug 2-DG has received approval as an adjuvant therapy for moderate to severe COVID-19 patients in India

By Dr Chandrakant Lahariya

In the fight against COVID-19 pandemic, vaccines and therapies are considered important tools. Scientists have been successful in developing few safe and effective vaccines, but there are not enough drugs that have been found to treat COVID-19.

A new drug, 2-deoxy-D-glucose or 2-DG, has been given license for emergency use by the Drug Controller General of India on May 1, 2021. The drug 2-DG has been developed by the Institute of Nuclear Medicine and Allied Sciences (INMAS), under the Defence Research and Development Organisation (DRDO), in collaboration with Hyderabad-based Dr Reddy's Laboratories (DRL). It has received approval as adjuvant therapy for moderate to severe COVID-19 patients in



India. Although 2-DG will be initially supplied to limited number of hospitals starting mid-May, it is expected to be widely available for all hospitals by mid-June.

2-DG was approved for emergency use in India on COVID-19 patients. News18 creative

What is 2-DG and how does it work?

2-DG is a drug derived from glucose. It is known to inhibit a metabolic pathway called glycolysis—the process of glucose formation in the cells—that becomes unregulated in cancer patients. This is the reason why it has been used as adjuvant therapy in cancer. Viruses also thrive on the glucose inside the cells. The inhibition of glycolysis in cells has the potential to reduce or stop their replication. This is the principle on which 2-DG has been considered for COVID-19. Studies have found that 2-DG selectively accumulates in the cells infected by the virus. Once inside those cells, it inhibits the excess glucose production, essential for virus replication, and therefore either slows down or completely stops the viral replication.

Has it been used in the past?

2-DG is not approved as primary treatment for any health condition, in any part of the world. However, it has reportedly been a part of more than 200 clinical trials against various cancers. The scientists at INMAS hypothesized that by interfering with glycolysis, the drug can help reduce the SARS-CoV-2 replication and can thus become effective in COVID-19 management. Thereafter,

INMAS took responsibility for testing 2-DG's efficacy against SARS-CoV-2. The potential role of 2-DG as therapy has also been discussed in a few research papers published from other parts of the world, over the last one year. However, till now, there is no published report stating that 2-DG has been tested for COVID-19 patients in actual hospital settings.

Has it been found safe and effective in clinical trials?

Before any drug can be recommended as therapy, its safety and efficacy have to be proven through clinical trials. Then, it should be licensed by the drug regulatory authority to be marketed. 2-DG has undergone various phases of clinical trials in India. The initial pre-clinical studies were conducted by the INMAS at DRDO and the Centre for Cellular and Molecular Biology (CCMB), Hyderabad, in April 2020. These studies concluded that the molecule (2-DG) works against SARS-CoV-2 and inhibits viral growth.

Thereafter, starting in May 2020, phase-2 clinical trial focused on drug dose ranges and safety. The phase-2 trial was conducted on 110 patients in 17 hospitals between May and October 2020. Then, phase-3 trials were conducted on 220 patients in 27 hospitals between December 2020 and March 2021. As is usual for drug clinical trials, the research institute (INMAS at DRDO) collaborated with a drug manufacturer (Dr Reddy's Laboratories).

The drug was approved for emergency use in India on COVID-19 patients. The findings from clinical trials are not available in the public domain. On May 8, 2021, an official press release and other statements from various official sources reported that those administered 2-DG in clinical trials demonstrated favourable trend (difference of 2.5 days as median time to achieve normalization of specific vital signs compared to the standard of care [SoC]). It was reported that "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".

So, have we got another therapy for COVID-19?

Till now, there are three proven treatments against COVID-19: Dexamethasone, blood thinners and oxygen supplementation. Rest of the drugs being used in COVID-19 in India are investigational therapies with off-label use. Their role is not proven but may have potential benefit, which is yet to be confirmed. 2-DG has been given approval under a very different sub-group of adjuvant therapy. And that is the key operational word, which needs to be understood.

The primary therapy has a direct role in treatment of a health condition. However, adjuvant therapy may facilitate the treatment but need not be effective on its own. Such mechanisms, once proven conclusively, help but as part of the main treatment. Adjuvant literally means 'add-on' and many vaccines carry some adjuvant, which helps in increasing their immunogenicity. It is a long way before the role of 2-DG can be proven conclusively, even as adjuvant therapy.

What are the concerns and next steps?

2-DG has been approved in India; however, no data based on phase-3 clinical trial is available in the public domain or published on pre-print server (peer-reviewed publication in a journal takes longer). However, experts have raised concerns regarding a few aspects of the clinical trials.

The sample size of 220 for phase-3 clinical trial is considered very small. The DRDO has not explained how the sample size was reached. It is widely known that studies with such small sample sizes are usually not helpful in providing information on drug safety and efficacy, conclusively. By now, we know from experience with Remdesivir, plasma therapy and a few other drugs used in COVID-19 management that small-scale trials are usually conflicting and inconclusive. Currently, there is insufficient data in the public domain on the trial design and it is not clearly known what constituted the efficacy outcomes for phase-3 trial. Drug efficacy can be best assessed by large-scale, multi-centric trial, where power of study is high and possibility of 'beta error' low. Many also argue that despite the emergency use approval by DCGI, the drug should continue to be investigated in large-scale clinical trials to generate more evidence.

The May 8 press release on the drug has thrice used the term 'significant'. In clinical research, the word significant does not hold much meaning, unless it means 'statistically significant', which

means p-value of <0.05 . If the reference is to ‘statistically significant’, then it should be used. The findings should be shared on how the sample size was arrived at.

What is the way forward?

The licensing of the drug is a good start. However, there is a definitive need for a well-designed, large-scale, multi-centric, randomized-controlled trial for the drug. Also, there is a need to manage public expectations and it should be clearly communicated to people that 2-DG is an adjuvant therapy and more evidence is needed. In other words, 2-DG is supplemental to the standard of care—the treatment guidelines suggested by ICMR and MoHFW for COVID-19 management in India. Although the drug is unlikely to be available in the open market (at least for some time), it should be ensured that people do not start demanding the drug, lining up for its purchase and stocking.

2-DG may not be the drug the world is looking for COVID-19 management (as yet); however, it gives us hope that the world could be on the right path to finding a cure.

(Disclaimer: Dr Chandrakant Lahariya is a public policy and health systems expert. He is the co-author of ‘Till We Win: India’s Fight Against The COVID-19 Pandemic’. He tweets at @DrLahariya. Views expressed are personal.)

<https://www.news18.com/news/opinion/past-use-safety-efficacy-an-expert-on-all-you-need-to-know-about-2-dg-drug-in-indias-covid-fight-3770195.html>

DRDO on Twitter



FPJ Free Press Jour...
@fpjindia

Indore: In a first in the city and probably in state, a 70-year-old woman was given the 2-deoxy-D-glucose (2-DG) drug developed by the Institute of Nuclear Medicine and Allied Sciences (INMAS), a lab of Defence Research and Development Organization (DRDO) in a private hospital.

12:29 AM · May 25, 2021

THE TIMES OF INDIA

Tue, 25 May 2021

Army Chief speaks to Royal Bhutan Army officer, discusses bilateral defence cooperation

New Delhi: Chief of Army Staff Gen M M Naravane on Monday spoke to Chief Operations Officer of the Royal Bhutan Army, Lt Gen Batoo Tshering, and discussed issues relating to bilateral defence cooperation.

The telephonic conversation between the two military officials came amid China's increasing assertiveness in the region.

"General M M Naravane #COAS had telephonic interaction with Lt Gen Batoo Tshering, #ChiefOperationsOfficer of the Royal Bhutan Army #RBA and discussed issues of bilateral defence cooperation," the Army tweeted.

According to a white paper on Tibet issued by the Chinese government on Friday, China is ramping up efforts to develop the infrastructure in remote villages located along Tibet's border with India, Bhutan and Nepal.

China shares an over 450-km-long border with Bhutan and it is yet to be delineated.

Bhutan is a strategically important country for India due to its location, and both sides have been steadily ramping up overall cooperation including in areas of defence and security.

<https://timesofindia.indiatimes.com/india/army-chief-speaks-to-royal-bhutan-army-officer-discusses-bilateral-defence-cooperation/articleshow/82917664.cms>



The telephonic conversation between the two military officials came amid China's increasing assertiveness in the region. (File photo)

Indian Army rapidly develops infrastructure for troops at LAC in Ladakh, northeast

Synopsis

India has also been working to develop the road infrastructure in all the sectors along the LAC and has speeded up work on the Nimu-Padam-Darcha axis which is going to help troops move to Ladakh from other parts of the country round the year.

The Indian Army, engaged in a military stand-off with the Chinese army for more than a year, has developed infrastructure and now the capability to accommodate a large number of troops in the habitats that have been built in the Ladakh sector and other areas along the Line of Actual Control (LAC).

These habitats would allow the troops to function efficiently even during the harsh winters experienced in Ladakh and sustain them through temperatures which sometimes go down to minus 45 degrees.

"Due to the military stand-off with China, the Indian Army has been able to complete the work planned in next five years in the last 12 months itself. The number of troops which can be easily accommodated and stationed in the Ladakh sector alone in the newly constructed habitats would be more than double the number of troops presents there," government sources told ANI.

According to estimates, both India and China have deployed more than 50,000 troops in the Eastern Ladakh sector opposite each other despite the limited disengagement in the Pangong lake sector by both sides earlier this year.

The sources said that the Corps of Engineers are still working all along the LAC to erect structures for the troops to operate there and accommodate additional forces if the need arises.

India has also been working to develop the road infrastructure in all the sectors along the LAC and has speeded up work on the Nimu-Padam-Darcha axis which is going to help troops move to Ladakh from other parts of the country round the year.

The defence ministry is also set to soon clear a proposal to allow the BRO to construct a 4.5 km-long tunnel for connectivity on the new road.

The road connectivity to all the forward locations has also been made available much before the due dates by the Army engineers.

The military standoff between the two sides had started in the month of April- May last year when the Chinese used a summer military exercise to divert troops for aggression along the Indian territory in the eastern Ladakh areas while they built up troops along in the Sikkim sector and other locations in the northeast to pressurise India.

<https://economictimes.indiatimes.com/news/defence/indian-army-rapidly-develops-infrastructure-for-troops-at-lac-in-ladakh-northeast/articleshow/82906927.cms>



China develops UAV with plateau ops capabilities, to deploy at LAC

China has developed an unmanned aerial vehicle (UAV) with plateau operations capabilities and plans to deploy it at Line of Actual Control with India in Kailash mountain range, sources said

New Delhi: China has developed an unmanned aerial vehicle (UAV) with plateau operations capabilities and plans to deploy it at Line of Actual Control with India in Kailash mountain range, sources said.

The UAV has been developed in Shaanxi and completed its first flying and control task at Gar Gansa in Tibet Autonomous Region, the sources said.

The flight was undertaken by the Hailan Aviation team. "The UAV took off from an elevation of 4,700 metre -- Baga Township -- and completed its task of patrolling, control and search operation in the Kailash mountain region," said the source.

The Kailash mountain range originates from the southern bank of Pangong Tso and runs northwest to southeast for over 60 km. It had been contested by India and China after the border dispute started in May last year.

The Kailash Ridge is characterised by rugged, broken terrain with heights varying between 4,000-5,500m. The ridge's key features include Gurung Hill, Spanggur Gap, Muggar Hill, Mukhpari, Helmet Top, Rezang La and Rechin La.

It dominates Chushul Bowl -- an important communications centre.

Last year, after the border dispute at the northern bank of Pangong Tso in Eastern Ladakh, China made an attempt to take over Kailash mountain range on the night of August 29 and August 30, 2020. Indian Army thwarted Chinese People's Liberation Army attempt and took control over most of the hills in the Kailash range.

Indian troops pre-empted this PLA activity on the Southern Bank of Pangong Tso Lake, undertook measures to strengthen their positions and thwarted Chinese intentions to unilaterally change facts on ground, Indian Army had stated.

This exposed Chinese deployment of its forces in Moldo.

In February this year, India and China started disengagement at the southern and northern bank of the Pangong Lake at Line of Actual Control. The disengagement happened after several rounds of military and diplomatic talks.

As per agreement, Indian troops vacated the mountain hills in Southern bank of Pangong Lake.

China moved back to Finger 8 and Indian troops pulled back to the Dhan Singh Thapa post between Finger 2 and 3. The north bank of the lake is divided into 8 Fingers. The mountain spur jutting into the lake are referred to as Finger in military parlance.

India claims Line of Actual Control at Finger 8 and had been holding on to the area till Finger 4 but in a clear alteration of status quo the Chinese have been camping at Finger 4 and have set up fortifications between Finger 5 and 8.

Since then Indian and Chinese military have met twice to resolve border disputes at other friction areas like Hot Springs, Gogra and 900 square km Depsang plains.

Amid this, China has again started enhancing troops, artillery and armour deployment in three sectors of Line of Actual Control -- western (Ladakh), middle (Uttarakhand, Himachal) and eastern (Sikkim, Arunachal). The Indian forces are keeping a close watch on Chinese activities at LAC.

https://www.business-standard.com/article/international/china-develops-uav-with-plateau-ops-capabilities-to-deploy-at-lac-121052400262_1.html



Press Information Bureau
Government of India

Ministry of Science & Technology

Mon, 24 May 2021 4:40PM

Three-dimensional distribution of molecular & atomic hydrogen in galaxies can give clues to star formation and galaxy evolution

A scientist has estimated the three-dimensional distribution of molecular and atomic hydrogen in a nearby galaxy which can help lead to clues to the star formation processes and the evolution of the galaxy.

Galaxies like the one we reside in, the Milky Way, consist of discs containing stars, molecular and atomic hydrogen, and helium. The molecular hydrogen gas collapses on itself in distinct pockets, forming stars, its temperature was found to be low --close to 10 kelvin, or -263 °C and thickness is about 60 to 240 light-years. The atomic hydrogen extends both above and below the discs.

However, more sensitive observations in the past two decades have surprised astronomers. They have estimated that molecular hydrogen extends farther from the disc in both directions, up to about 3000 light-years. This gaseous component is warmer than the one straddling the disc and has comparatively lesser densities, thus escaping earlier observations. They called it the 'diffuse' component of the molecular disc.

How much of the total molecular hydrogen is this diffuse component of the disc remains unclear. In a new study, a researcher from Raman Research Institute (RRI), Bengaluru, an autonomous organisation of the Department of Science and Technology (DST), Government of India, has carried out mathematical calculations on the computer and used publicly available astronomical data of a nearby galaxy to pin down the ratio of the narrow and diffuse gaseous components. The study, funded by the DST, Government of India, was published in the journal *Monthly Notices of the Royal Astronomical Society*.

“The molecular hydrogen gas converts to individual stars under the pull of gravity, thus holding clues to the star formation processes and the evolution of the galaxy,” said Narendra Nath Patra, the researcher. If a significant part of the gas extends beyond the thin disc of a few hundred light-years, it may explain why astronomers also observe stars at a few thousand light-years perpendicular to the galactic disc. It is also essential to understand why the gas has two components, he says, and maybe tell-tale signatures of supernovae or exploding stars.

For the study, Narendra focussed on a single galaxy about 20 million light-years away from the Milky Way. The distance is relatively small compared to the size of the universe, more than 10 billion light-years. The galaxy's proximity makes it easier to observe with telescopes, and spectral lines of carbon monoxide (CO) are available for public research. “The carbon monoxide molecule



The Andromeda Galaxy, the nearest major galaxy to our own, the Milky Way. Image Credits: FarmakopoulosAntonis

is known to accurately trace molecular hydrogen, whose spectral lines are more difficult to observe,” explains Narendra. “The galaxy I chose is very much like the Milky Way and is therefore interesting for studying the ratio of diffuse and thin components of the disc,” he adds.

The researcher used the observed spectral lines of the CO molecule to infer the three-dimensional distribution of both the narrow disc component and the diffuse component of molecular hydrogen. Estimating how the ratio of the two components varies with the distance away from the centre of the galaxy, he found that the diffuse component makes up about 70 percent of the molecular hydrogen, and this fraction remains roughly constant along the radius of the disc. “This is the first time that such a calculation has been done for any galaxy,” he asserts.

The method, although new, relies on calculations that can be carried out on computers with the help of publicly available data. Hence, Narendra is already on his way to employing it on other nearby galaxies. “Currently, our group at RRI is employing the same strategy for a set of eight galaxies whose CO lines are available,” he says. “We want to test whether the results were one-off for the galaxy I chose or if there is a pattern,” he pointed out. The search is on, and we may expect the results this year.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1721281>



पत्र सूचना कार्यालय
भारत सरकार

विज्ञान एवं प्रौद्योगिकी मंत्रालय

Mon, 24 May 2021 4:40PM

आकाशगंगाओं में आणविक और परमाणु हाइड्रोजन के त्रि-आयामी वितरण से तारों के निर्माण और आकाशगंगा के विकास के संकेत मिल सकते हैं

एक वैज्ञानिक ने पृथ्वी की एक करीबी आकाशगंगा में आणविक और परमाणु हाइड्रोजन के त्रि-आयामी वितरण का अनुमान लगाया है जिनसे तारों के निर्माण की प्रक्रियाओं और आकाशगंगा के विकास के संकेत पाने में मदद मिल सकती है।

हम जिस आकाशगंगा में रहते हैं, उसकी तरह की आकाशगंगाओं में तारे, आणविक और परमाणु हाइड्रोजन और हीलियम युक्त डिस्क होते हैं। आणविक हाइड्रोजन गैस अलग-अलग क्षेत्रों में अपने आप ढह जाती है, जिससे तारे बनते हैं, इसका तापमान कम पाया गया जो 10 केल्विन के करीब, या -263 डिग्री सेल्सियस है और मोटाई लगभग 60 से 240 प्रकाश-वर्ष है। परमाणु हाइड्रोजन डिस्क के ऊपर और नीचे दोनों तरफ फैला हुआ है।

हालांकि, पिछले दो दशकों में अधिक संवेदनशील निरीक्षणों ने खगोलविदों को हैरान कर दिया है। उन्होंने अनुमान लगाया है कि आणविक



हमारे अपने मिल्की वे की सबसे नजदीकी आकाशगंगा - एंड्रोमेडा आकाशगंगा (तस्वीर साभार: FarmakopoulosAntonis)

हाइड्रोजन डिस्क से दोनों दिशाओं में लगभग 3000 प्रकाश-वर्ष तक फैली हुई है। यह गैसीय घटक डिस्क को फैलाकर रखने वाले घटक की तुलना में गर्म होता है और इसमें तुलनात्मक रूप से कम घनत्व होता है, इस वजह से ये पहले के निरीक्षणों से बच गए। उन्होंने इसे आणविक डिस्क का 'बिखरा हुआ' घटक कहा है।

यह स्पष्ट नहीं है कि डिस्क का यह बिखरा हुआ घटक कुल आणविक हाइड्रोजन का कितना बड़ा हिस्सा है। एक नए अध्ययन में, भारत सरकार के विज्ञान और प्रौद्योगिकी विभाग (डीएसटी) के स्वायत्त संगठन, रमन रिसर्च इंस्टीट्यूट (आरआरआई), बेंगलुरु के एक शोधकर्ता ने कंप्यूटर पर गणितीय गणना की है और संकीर्ण एवं बिखरे हुए गैसीय घटकों के अनुपात को कम करने के लिए पास की एक आकाशगंगा से जुड़े सार्वजनिक रूप से उपलब्ध खगोलीय डेटा का उपयोग किया है। डीएसटी, भारत सरकार द्वारा वित्त पोषित अध्ययन, रॉयल एस्ट्रोनॉमिकल सोसाइटी के मंथली नोटिसेज पत्रिका में प्रकाशित हुआ था।

शोधकर्ता नरेंद्र नाथ पात्र ने कहा, "आणविक हाइड्रोजन गैस गुरुत्वाकर्षण के खिंचाव के तहत अलग-अलग तारों में बदल जाती है, इस प्रकार इनसेतारों के निर्माण की प्रक्रियाओं और आकाशगंगा के विकास का संकेत मिल सकता है।" अगर गैस का एक महत्वपूर्ण हिस्सा कुछ सौ प्रकाश-वर्ष की पतली डिस्क से आगे बढ़ता है, तो यह समझा जा सकता है कि खगोलविद गैलेक्टिक डिस्क के लंबवत कुछ हजार प्रकाश-वर्ष पर सितारों का निरीक्षण क्यों करते हैं। उन्होंने कहा कि यह समझना भी आवश्यक है कि गैस के दो घटक क्यों हैं, और शायद इनसे सुपरनोवा या विस्फोट करने वाले तारों के स्पष्ट संकेत मिल सकते हैं।

नरेंद्र ने अध्ययन के लिए आकाशगंगा से लगभग दो करोड़ प्रकाश वर्ष दूर स्थित एक अकेली आकाशगंगा पर ध्यान केंद्रित किया। ब्रह्मांड के 10 अरब से अधिक प्रकाश वर्ष के आकार की तुलना में दूरी अपेक्षाकृत कम है। आकाशगंगा की निकटता दूरबीन के साथ निरीक्षण करने को आसान बनाती है, और कार्बन मोनोऑक्साइड (सीओ) की वर्णक्रमीय रेखाएं सार्वजनिक अनुसंधान के लिए उपलब्ध हैं। नरेंद्र ने कहा, "कार्बन मोनोऑक्साइड अणु आणविक हाइड्रोजन का सटीक पता लगाने के लिए जाना जाता है, जिसकी वर्णक्रमीय रेखाओं का निरीक्षण करना अधिक कठिन होता है। मैंने जो आकाशगंगा चुनी है, वह मिल्की वे की तरह है और इसलिए डिस्क के बिखरे हुए एवं पतले घटकों के अनुपात का अध्ययन करने के लिए दिलचस्प है।"

शोधकर्ता ने कार्बन मोनोऑक्साइड अणु की प्रेक्षित वर्णक्रमीय रेखाओं का उपयोग संकीर्ण डिस्क घटक और आणविक हाइड्रोजन के बिखरे हुए घटक दोनों के त्रि-आयामी वितरण का अनुमान लगाने के लिए किया। यह अनुमान लगाते हुए कि आकाशगंगा के केंद्र से दूरी के साथ दो घटकों का अनुपात कैसे बदलता है, उन्होंने पाया कि बिखरा हुआ घटक आणविक हाइड्रोजन का लगभग 70 प्रतिशत बनाता है, और यह अंश डिस्क की त्रिज्या के साथ लगभग स्थिर रहता है। नरेंद्र ने कहा, "यह पहली बार है जब किसी भी आकाशगंगा के लिए इस तरह की कोई गणना की गई है।"

यह विधि हालांकि नयी है और उन गणनाओं पर निर्भर करती है जो सार्वजनिक रूप से उपलब्ध डेटा की सहायता से कंप्यूटर पर की जा सकती हैं। इसलिए, नरेंद्र पहले से ही आस-पास की अन्य आकाशगंगाओं पर इसका इस्तेमाल करने में लगे हुए हैं। उन्होंने कहा, "इस समय आरआरआई में हमारा समूह आठ आकाशगंगाओं के एक समूह के लिए एक ही रणनीति का इस्तेमाल कर रहा है, जिनकी कार्बन मोनोऑक्साइड रेखाएं उपलब्ध हैं। हम इस बात की जांच करना चाहते हैं कि क्या यह मेरे द्वारा चुनी गई आकाशगंगा से जुड़े एकबारगी परिणाम हैं या बाकी आकाशगंगाओं के साथ भी ऐसा ही है। हमारी खोज जारी है, और हम इस वर्ष परिणाम की उम्मीद कर सकते हैं।"

<https://pib.gov.in/PressReleasePage.aspx?PRID=1721386>

How will ISRO use Nuclear Energy in Space Missions? All about Radioactive Thermoelectric Generators here

UR Rao Satellite Centre (URSC) of Indian Space Research Organization (ISRO) is going to use Radioactive Thermoelectric generators for power generation and thermal management of various space missions. Know all about it here

By Tulika Tandon

Radioisotope Thermo-electric Generator: Why in the News?

In January 2021, the UR Rao Satellite Centre (URSC) of Indian Space Research Organization (ISRO) invited proposals for the three phase development of a 100 Watt Radioisotope Thermo-electric Generator (RTG).

UR Rao Satellite centre is ISRO's lead centre for design, development, fabrication and testing of all Indian made satellites. Now it would be using Radioactive Thermoelectric generators for power generation and thermal management of various space missions.



Radioisotope Thermo-electric Generator

All about Radioisotope Thermo-electric Generator (RTG):

Radioisotope Thermoelectric Generator is a kind of a nuclear battery using thermocouple to convert the heat released by decay of radioactive material into electricity. Seebeck effect governs it and it generally has no movable parts.

(The "Seebeck effect" is a phenomenon in which a temperature difference between two dissimilar electrical conductors or semiconductors produces a voltage difference between the two substances.)

Working benefits of RTG:

1. To know about the working of RTG let us know the working of a normal satellite:
2. The normal satellites are launched in multiple stages. The first stage being the strap on boosters and in the second stage these are loosened by the satellites. In Indian satellites Vikas Liquid Engine is used in the second stage. The third stage is reached after detaching the second stage and finally the satellite is sent into space. The energy used is Solar Energy in normal satellites.
3. Like other satellites use heavy carriers for energy generation making the satellites bulky, RTG systems use thermocouples and natural decay of radioactive isotopes into electrical energy. This makes them less bulkier.
4. They are reliable and maintenance free because the moving parts in thermocouples that cause failure of machinery are absent in RTG system
5. The RTG systems are more fuel efficient than normal satellite systems.
6. These are lighter than chemical rockets and thus they would travel further, faster and would shorten the time duration of the trip.
7. Since they do not work on solar power, they enable the satellite to function on the darker sides of the planets.

Which Systems Require RTG Technology?

RTGs are established in systems under some of the following circumstances:

1. Systems that are unable to be continually maintained and serviced

2. Systems those are incapable of generating solar energy efficiently
3. Systems that need to remain operating without human aid for long durations of time
4. Systems that require minimal human interaction

Design of the RTG:

The typical design of an RTG is actually relatively simple and straightforward, consisting of two crucial ingredients: fuel that will decay radioactively and a large set of thermo- couples to convert heat into electricity.

The fuel is located behind the thermal insulation layer and the thermocouple are lined in modules throughout the sides of the RTG. Check in the image below.

What are the characteristics of the isotopes required for RTG?

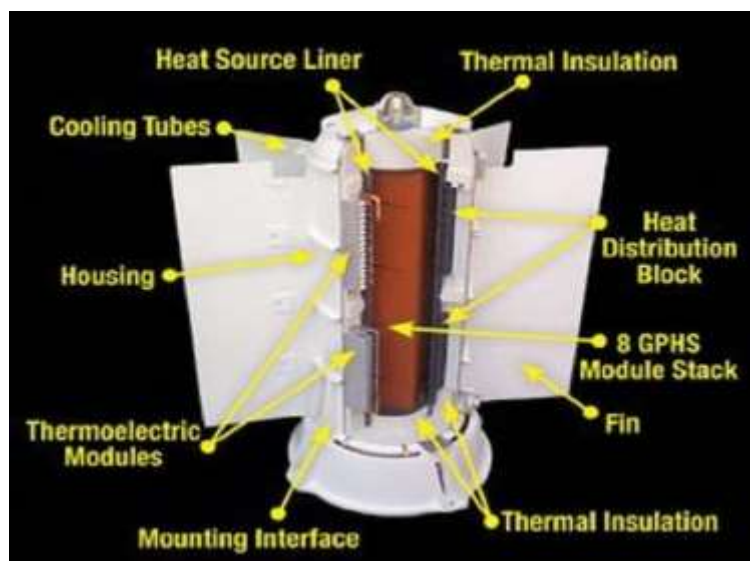
The isotopes must have:

1. The ability to produce high energy radiation
2. The tendency to produce radiation decay heat
3. The possession of long half-life for continuous energy production
4. The large heat power-to-mass (or density) ratio

The most frequently used isotopes for RTG fuel are Plutonium-238 (Pu-238), Strontium-90 (Sr-90), and Curium-244 (Cm-244). Among them Pu-238 is the most cited fuel on most resources about RTGs.

Is India the first to use RTGs?

No, India is not the first country to use the RTG technology but the technology in itself is not very popular. The RTGs were for the first time used in space after the Cold War in 1961 for USA's Transit-4A Mission. The Soviet Union had also launched the two dozen nuclear power space objects. These have also been used as power sources in space probes and remote facilities.

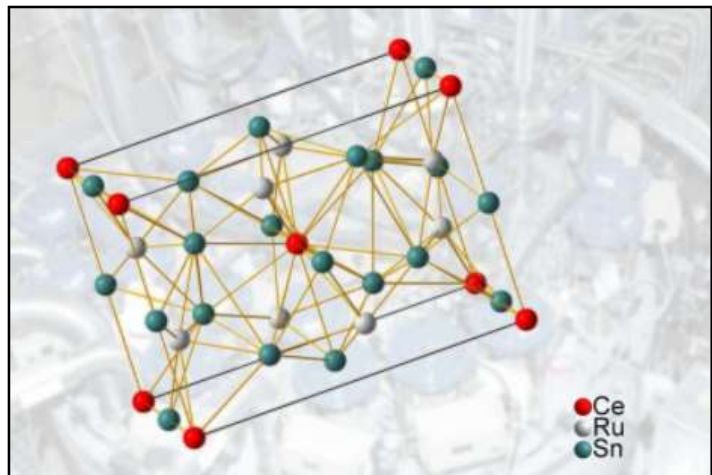


<https://www.jagranjosh.com/general-knowledge/how-will-isro-use-nuclear-energy-in-space-missions-know-all-about-rtgs-here-1621851058-1>

New quantum material discovered

In everyday life, phase transitions usually have to do with temperature changes—for example, when an ice cube gets warmer and melts. But there are also different kinds of phase transitions, depending on other parameters such as magnetic field. In order to understand the quantum properties of materials, phase transitions are particularly interesting when they occur directly at the absolute zero point of temperature. These transitions are called "quantum phase transitions" or a "quantum critical points."

Such a quantum critical point has now been discovered by an Austrian-American research team in a novel material, and in an unusually pristine form. The properties of this material are now being further investigated. It is suspected that the material could be a so-called Weyl-Kondo semimetal, which is considered to have great potential for quantum technology due to special quantum states (so-called topological states). If this proves to be true, a key for the targeted development of topological quantum materials would have been found. The results were found in a cooperation between TU Wien, Johns Hopkins University, the National Institute of Standards and Technology (NIST) and Rice University and has now been published in the journal *Science Advances*.



A compound of cerium, ruthenium and tin—with surprising properties. Credit: TU Wien

Quantum criticality—simpler and clearer than ever before

"Usually quantum critical behavior is studied in metals or insulators. But we have now looked at a semimetal," says Prof. Silke Bühler-Paschen from the Institute of Solid State Physics at TU Wien. The material is a compound of cerium, ruthenium and tin—with properties that lie between those of metals and semiconductors.

Usually, quantum criticality can only be created under very specific environmental conditions—a certain pressure or an electromagnetic field. "Surprisingly, however, our semimetal turned out to be quantum critical without any external influences at all," says Wesley Fuhrman, a Ph.D. student in Prof. Collin Broholm's team at Johns Hopkins University, who made an important contribution to the result with neutron scattering measurements. "Normally you have to work hard to produce the appropriate laboratory conditions, but this semimetal provides the quantum criticality all by itself."

This surprising result is probably related to the fact that the behavior of electrons in this material has some special features. "It is a highly correlated electron system. This means that the electrons interact strongly with each other, and that you cannot explain their behavior by looking at the electrons individually," says Bühler-Paschen. "This electron interaction leads to the so-called Kondo effect. Here, a quantum spin in the material is shielded by electrons surrounding it, so that the spin no longer has any effect on the rest of the material."

If there are only relatively few free electrons, as is the case in a semimetal, then the Kondo effect is unstable. This could be the reason for the quantum critical behavior of the material: the system fluctuates between a state with and a state without the Kondo effect, and this has the effect of a phase transition at zero temperature.

Quantum fluctuations could lead to Weyl particles

The main reason why the result is of such central importance is that it is suspected to be closely connected to the phenomenon of "Weyl fermions." In solids, Weyl fermions can appear in the form of quasiparticles—i.e. as collective excitations such as waves in a pond. According to theoretical predictions, such Weyl fermions should exist in this material," says theoretical physicist Qimiao Si of Rice University. Experimental proof, however, is yet to be found. "We suspect that the quantum criticality we observed favors the occurrence of such Weyl fermions," says Silke Bühler-Paschen. "Quantum critical fluctuations could therefore have a stabilizing effect on Weyl fermions, in a similar way to quantum critical fluctuations in high-temperature superconductors holding superconducting Cooper pairs together. This is a very fundamental question that is the subject of a lot of research around the world, and we've discovered a hot new lead here."

It seems to us that certain quantum effects—namely quantum critical fluctuations, the Kondo effect and Weyl fermions—are tightly intertwined in the newly discovered material and, together, give rise to exotic Weyl-Kondo states. These are 'topological' states of great stability that, unlike other quantum states, cannot be easily destroyed by external disturbances. This makes them particularly interesting for quantum computers.

To verify all this, further measurements under different external conditions are to be carried out. The team expects that a similar interplay of the various quantum effects should also be found in other materials. "This could lead to the establishment of a design concept with which such materials can be specifically improved, tailored and used for concrete applications," says Bühler-Paschen.

More information: Wesley T. Fuhrman et al, Pristine quantum criticality in a Kondo semimetal, *Science Advances* (2021). [DOI: 10.1126/sciadv.abf9134](https://doi.org/10.1126/sciadv.abf9134)

Journal information: [Science Advances](https://www.science.org)
<https://phys.org/news/2021-05-quantum-material.html>

COVID-19 may increase the risk of other illnesses

By Erika Watts

- *A recent study concludes that people with COVID-19 have an increased risk of developing a new health problem after the initial phase of the underlying infection.*
- *The study reviewed data from more than 200,000 people who had diagnosed COVID-19.*
- *While older people are more likely to have poor COVID-19 outcomes, the study suggests that younger people have a higher risk of developing new health conditions.*

With worldwide numbers of COVID-19 cases in decline since April, there has been more focus on life after the pandemic. Many researchers are interested in figuring out the long-term effects of a SARS-CoV-2 infection.

A new study, which appears in *BMJ* Trusted Source, examined the elevated risk of developing a new health condition following a SARS-CoV-2 infection.

COVID-19 background

Since the World Health Organization (WHO) declared that COVID-19 cases constituted a pandemic more than 1 year ago, just over 164 million people have contracted the underlying virus, and 3.4 million people have died as a result.

Many with the infection are asymptomatic, but others have symptoms that can range from mild to severe. The virus has overwhelmed the healthcare systems of some countries, with hospital intensive care units filled beyond capacity due to the number of severely ill COVID-19 patients.

The symptoms of COVID-19 may clear up within a matter of weeks, but they can last much longer. Doctors sometimes refer to this issue as “long COVID” and the people who experience it as “long haulers.”

Study indicates elevated risk

The new retrospective study examined people who had tested positive for SARS-CoV-2 between January 1 and October 31, 2020. From 266,586 people with SARS-CoV-2 infections, the researchers examined the records of 193,113 participants who were diagnosed with COVID-19 and followed for at least 21 days.

The participants were aged 18–65, and according to the paper, each was part of a “large United States health plan.” To track the participants, the researchers took information from a national claims database, a laboratory testing database, and an inpatient hospital admissions database.

The researchers checked the participants’ records to see how many had been diagnosed with a new medical condition within 6 months of the “post-acute phase,” which they defined as a period beginning 3 weeks after the initial COVID-19 diagnosis.

After compiling this data, the study authors compared it with data from other groups who had been admitted to the hospital, including a group with a continuous healthcare plan in 2020 who did not have diagnosed COVID-19.



A new study focuses on health outcomes after the initial infection that causes COVID-19. Kilito Chan/Getty Images

The researchers found that 14% of participants with COVID-19 had developed at least one new medical condition that required treatment following the acute phase of their SARS-CoV-2 infection.

A new health condition that occurs as a consequence of a previous illness is called a “sequela.” The authors write:

“An increased risk of specific clinical sequelae after the acute infection was noted across a range of organ systems, including cardiovascular, neurologic, kidney, respiratory, and mental health complications.”

The risk of developing a new condition was 5% higher among this group, compared with the control group who did not have diagnosed COVID-19.

The increased likelihood of experiencing a new medical condition following a SARS-CoV-2 infection was not limited to older people or people with preexisting conditions. Many younger people, including those with no previous history of health issues, developed a new condition after having COVID-19.

“Healthcare professionals should be alert to the possibility of long COVID in anyone with confirmed or suspected COVID-19. How to treat these longer-term consequences is now an urgent research priority,” Dr. Elaine Maxwell, a scientific advisor at the National Institute for Health Research, in London, wrote in an associated editorial^{Trusted Source}.

Implications of the study

The results of this study emphasize the importance of reducing the spread of COVID-19. While the most obvious result of doing so is a reduction in deaths and hospital admittances, it is also important to consider the longer-term effects on healthcare systems throughout the world.

“The greater risk for incident sequelae after the acute phase of SARS-CoV-2 infection is relevant for healthcare planning,” the study authors highlight.

In an interview with *Medical News Today*, Dr. William Schaffner, a professor of medicine in the Division of Infectious Diseases at Vanderbilt University Medical Center, in Nashville, TN, shared his thoughts on the new study.

“This is a solid study that provides an estimate of how frequently such new symptoms occur: 14%,” Dr. Schaffner said. “This is a very high proportion of patients. There was a wide spectrum of symptoms involving numerous organ systems. The impact on the healthcare system of these many patients requiring medical care over a long period of time will be substantial.”

Potential limitations

The researchers acknowledge that their study had some flaws. They were not able to include the risk of death, for example, due to the limitations of their databases.

Also, they note that they may have misclassified some participants. For example, while participants in the control group had no diagnosis of COVID-19, the illness may have been undiagnosed in some people, which has the potential to skew the data.

<https://www.medicalnewstoday.com/articles/covid-19-may-increase-the-risk-of-other-illnesses>

