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

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hindustantimes

Tue, 25 Aug 2020

PM-initiated 500-bed Covid care hospital in Patna opens to public

The PM had directed the ministry of home affairs to establish 500-bed hospitals at Patna and Muzaffarpur, considering the gravity of the Covid-19 situation in Bihar

By Ruchir Kumar

Patna: The 500-bed makeshift Covid Care Hospital at Bihta in Patna, funded under the PM CARES (Prime Minister's Citizen Assistance and Relief in Emergency situations), was opened to public on Monday afternoon.

Union minister of state for home affairs, Nityanand Rai, inaugurated the hospital in presence of Bihar health minister Mangal Pandey.

"PM-CARES Fund Trust has decided to allocate funds for fight against COVID-19 by way of establishment of 500-bed COVID-19 makeshift hospitals at Patna and Muzaffarpur, Bihar, by DRDO. This will go a long way in improving COVID care in Bihar," PMO India tweeted.

Earlier, in mid-July, a Central team had cautioned the state on hospital infrastructure and suggested setting up temporary field hospitals, taking into consideration the case growth trajectory for at least the next two months.

"A similar hospital at Muzaffarpur is expected to be ready by August 30," said Bihar's principal secretary, health, Pratyaya Amrit.

The Defence Research and Development Organisation (DRDO), which was entrusted with the project, has provided hospital infrastructure, which includes 125 ICU (intensive care unit) beds with ventilators, monitors; and 375 normal beds. Centralised piped oxygen supply will be available for each bed.

The director-general, Armed Forces Medical Services Doctors, will provide doctors and other support staff, stated a press release issued by DRDO. It will also handle medical documentation and medico-legal issues, the communique added.

"The state government has provided nurses, free uninterrupted water and power supply, air conditioners in 25 rooms with soft furnishing, security arrangements and fire tenders with crew," said Amrit.

The hospital will be equipped with CCTV surveillance system. DRDO has also made pharmacy, medical pathology laboratory, catering, laundry and ambulance services available. All services will be free, the communique said.

The DRDO will also take care of the computerised hospital management system, providing personal protective equipment (PPE) kits and sanitiser, housekeeping services, consumable items, furniture and soft furnishing, such as bed sheets, pillows, pillow covers, blankets, towels, etc. It



The hospital includes 125 ICU (intensive care unit) beds with ventilators, monitors; and 375 normal beds.(Santosh Kumar/HT Photo)

will also provide maintenance staff for specialised services like electrical works, air conditioning, operating diesel generator sets, etc., the communique added.

The PM had directed the Ministry of Home Affairs to establish 500-bed hospitals at Patna and Muzaffarpur, considering the gravity of the Covid-19 situation in Bihar. The MHA approached the DRDO to make one each in Patna and Muzaffarpur along the same lines as the 1,000-bed Sardar Vallabhai Patel makeshift Covid hospital in Delhi.

As on Monday, Bihar reported a total 1,23,383 Covid-19 cases with 627 deaths. Patna alone reported 19,112 cases and 124 deaths, the highest in Bihar. Muzaffarpur came next with 5,298 cases and 25 deaths.

The Central team had also advised the state to increase the number of all health personnel on the front-lines, ensure infection prevention practices and proper roster system for patient management, besides making available sufficient logistics and a regular supply of oxygen in all Covid-19 hospitals.

On July 23, Bihar health secretary Lokesh Kumar Singh had said that of the 40,000 beds designated for district Covid care centres (for mildly symptomatic or asymptomatic Covid-19 patients), 20,000 beds had been readied. The department was then in the process of arranging for 4,000 additional beds in dedicated Covid health centres in districts for patients with mild-to-moderate cases, besides increasing 3,500 beds (against an existing 2,500 approx. then) for the third level at medical college hospitals, which are for severe and critical cases.

The health department Monday did not share an update on the availability of beds for Covid patients and the occupancy.

<https://www.hindustantimes.com/patna/pm-initiated-500-bed-covid-care-hospital-in-patna-to-open-today/story-pEu2aoMPllsFVCZx7cHGEO.html>



Tue, 25 Aug 2020

500 bed Covid hospital with 125 ICU beds, set up by DRDO in Patna inaugurated

New Delhi: A 500 bed Covid Hospital with 125 ICU beds, set up by Defence Research & Development Organisation (DRDO) in Patna was inaugurated today by Shri Nityanand Rai, Union Minister of State for Home Affairs. The hospital located in the newly constructed ESIC Hospital at Bihta, has been built on the lines of the 1000 Bed Sardar Vallabhbai Patel Hospital at Delhi Cantt built by DRDO.

Prime Minister's Citizen Assistance and Relief in Emergency Situations (PM CARES) Trust has allocated funds for the hospital. Another such hospital will be set up in Muzaffarpur.

The infrastructure facilities for the hospital include the already existing seven storied ESIC hospital with Power, air conditioning, Water supply, Fire Fighting and Diesel Generator Backup, Oxygen piping to each bed, Lifts and Morgue.

DRDO has provided infrastructure for the hospital such as the Administrative Block including Doctor's room, Triage Area, Visitors Area and Reception; ICU Beds with Ventilators, monitors : 125 Nos; Normal Beds : 375 Nos.; 10 KL Cryogenic Liquid Medical oxygen Vessel; Oxygen supply to every bed; PPE Kits and Sanitizers; CCTV Surveillance System; Housekeeping Services including consumable items; Pharmacy, Medical Pathology Lab, Catering Services, Laundry



Services, Ambulance Service; Computerized Hospital Management System; Professional Manning & Maintenance Staff for specialised services like Electrical System, Air conditioning System, DG Sets, etc.

Doctors, nurses, and other supporting medical staff etc for the hospital have been provided by the Directorate General Armed Forces Medical Services (DGAFMS).

Bihar Government will provide free of cost facilities such as 2 Lakh Ltrs of water per day, 6 MVA electric supply and security arrangements for the hospital.

<https://indiaeducationdiary.in/500-bed-covid-hospital-with-125-icu-beds-set-up-by-drdo-in-patna-inaugurated/>

DRDO Technology News

BusinessLine

Tue, 25 Aug 2020

DRDO Chief G Satheesh Reddy gets two-year extension

Hyderabad: G Satheesh Reddy has been given a two-year extension as the Chairman of Defence Research and Development Organisation (DRDO), in an order issued by the Personnel Ministry.

He was appointed to the post in August 2018 for two years, and now has gotten two year extension.

The Appointments Committee of the Cabinet has approved the extension of Reddy's tenure as the DRDO chairman and as the Secretary of the Department of Defence Research & Development for a period of two years beyond August 26.



G Satheesh Reddy, DRDO Chairman

<https://www.thehindubusinessline.com/news/science/drdo-chief-g-satheesh-reddy-gets-two-year-extension/article32432168.ece>



DRDO identifies 108 Systems and Subsystems for industry to design, develop and manufacture towards achieving “Atmanirbhar Bharat”

Responding to the clarion call given by Hon’ble Prime Minister for “Atmanirbhar Bharat”, the Defence Research & Development Organisation (DRDO) has taken several initiatives to strengthen the indigenous defence ecosystem. Towards this, A DRDO delegation met with Raksha Mantri Shri Rajnath Singh today to apprise him about 108 systems and subsystems which have been identified for designing and development by the Indian Industry only. The list of technologies is enclosed at Appendix . This initiative will pave the way for Indian Defence industry to develop many technologies towards building an AtmaNirbhar Bharat.

DRDO will also provide support to industries for design, development and testing of these systems on requirement basis. All the requirements of these systems by R&D establishments, Armed Forces, and other Security Agencies can be met through development contracts or production orders on suitable Indian industry. This will allow DRDO to focus on design & development of critical and advanced technologies and systems.

DRDO has been partnering with industry for realization of its systems. Collaborating with DRDO in the development of major weapon systems the Indian industry has matured to a stage where they can develop systems on their own. Indian industry has progressed from a ‘build to print’ partner to ‘build to specification’ partner.

The present industry base for DRDO consists of 1800 MSMEs along with DPSUs, Ordnance Factories and large scale industries. DRDO has already taken major initiatives through various policies to involve Indian industry as Development cum Production Partners (DcPP), offering its technology to industry at nominal cost and providing free access to its patents.

This initiative will support the fast growing Indian defence industrial ecosystem and will help the industry to contribute towards “Atmanirbhar Bharat” in a big way.

Appendix

Systems/ Sub systems for Industry to Design, Develop and Manufacture

S.No.	System	Time-lines
1	Mini & Micro UAVs	2020
2	Mini & MicroRoVs	2020
3	Un-cooled NV-IR sights for weapons (short range)	2020
4	Mountain Foot Bridge (Metallic)	2020
5	Multi Span Bridge (Metallic)	2020
6	Modular Bridge (Metallic)	2020
7	Floating Bridge (Metallic)	2020

S.No.	System	Time-lines
8	Mines Laying and Marking Equipments	2020
9	NBC Shelters	2020
10	Armoured Engineering Reconnaissance Vehicle (AERV)	2020
11	Multipurpose Decontamination Systems (MPDS)	2020
12	Mobile Decontamination System (MDS)	2020
13	Solo Vehicle Based Transporter cum Tilter System	2020
14	Special Purpose Transporters upto 80 T Payload	2020
15	Loader cum Replenishment (LCR) Vehicles	2020
16	Anti-Terrorist Vehicle (ATV)	2020
17	Heavy Recovery Vehicle	2020
18	IR flare	2020
19	Tank Transporter	2020
20	Multi Spectral Camouflage Net (MSCN)	2021
21	Unit Maintenance Vehicle	2021
22	Unit Repair Vehicle	2021
23	Bullet Proof Vehicle	2020
24	Missile Canisters	2020
25	Missile Assembly Jigs	2020
26	Missile Storage Containers	2020
27	Marine Rocket Launcher	2020
28	Image Intensified (II)Based Weapon Sights	2021
29	Single Mode LASER Source(up to 2 kW)	2020
30	Blast Doors	2020
31	Fire Detection Systems	2020
32	Telemedicine System	2020
33	Satellite Navigation Receivers	2020
34	Fabric for Parachutes	2021
35	TR Modules	2020

S.No.	System	Time-lines
36	Batteries (Ag-Zn , Li Ion, Thermal)	2021
37	MicrowaveReceivers	2021
38	Single Board Computer	2020
39	Hardware for Onboard Computers	2021
40	Pneumatic Actuator System (upto 450 kgf)	2020
41	Stabilization Systems for Ground Based Applications	2020
42	Display Systems	2020
43	Hydraulic Actuation Systems (upto 16 T)	2021
44	Electro Mechanical Actuators (upto 2T)	2021
45	Cable Looms	2020
46	Relay Units	2020
47	Hardware for Fire Control Systems	2020
48	Video converters	2020
49	Display Processors	2020
50	Navigation Radars	2020
51	Blast Sensors	2020
52	Routers	2021
53	Electric Power Conditioners	2021
54	Germanium Blanks	2021
55	Optical Blanks (VK 7, fused Silica)	
56	Solenoid valve (> 10 ms)	2021
57	EMP protected Racks	2020
58	Shelters for Radar & Communication	2021
59	Antennas for Satellite Communication Receivers	2021
60	Airborne Displays	2021
61	PCM Decomuntation System	2020
62	Tele command System	2020
63	Transponder System	2020

S.No.	System	Time-lines
64	Onboard SCP for Telemetry	2020
65	Onboard PCM for Telemetry	2020
66	Onboard Antennae for Telemetry	2020
67	High Nitrogen Steel	2020
68	2xxx, 5xxx,6xxx and 7xxx series Aluminum	2020
69	Rotary Joints	2020
70	Slip Rings	2021
71	Bearings High speed (Miniature)	2020
72	Torpedo Tubes	2020
73	Pressure Transducers	2021
74	Bus Controllers for 1553, CAN, 1773	2020
75	Power PC Back Planes	2020
76	Umbilical Connectors	2020
77	RF Cables	2020
78	RF Connectors	2020
79	Miniature Bearings	2021
80	Slewing Rings	2021
81	MIL – Connectors	2020
82	MIL – Relays (Electro Mechanical)	2020
83	MIL – Relays (Solid state)	2020
84	Pressure Tight and Non Pressure Tight Cable	2020
85	Pressure Tight and Non Pressure Tight Connectors	2021
86	RF power Amplifier	2020
87	Bulk Up Converters	2020
88	EMP Power Line Filters	2020
89	EMP Data Filters	2020
90	EMI/EMC Filters	2020
91	EMI/EMC Gaskets	2020

S.No.	System	Time-lines
92	Composite Materials Sea Water Pumps 40TPH & 125 TPH	2021
93	Miniature Self-regulating Dual Flow JT Cooler	2021
94	Solid State TTR, CTS, TAR Magnetron for OSA-AK-M	2021
95	Amplidyne	2021
96	Secure Customized 3G/LTE end –Points (Handsets/Dongles) for Mobile Network	2021
97	Pressure Measuring Instrument for Aircraft Application	2021
98	Air Data Probe for Aircraft Application	2021
99	Pumps for Aircraft Application-Hydraulic	2021
100	Nose Wheel Steering Manifold	2021
101	Angle of Attack & Angle of Side Slip Sensors	2021
102	Rotary Actuation Aggregators for Fighter Aircraft Application	2021
103	Total Air Temperature Probe	2021
104	Potentiometer for Aircraft Application	2021
105	Fuel System Components for Aircraft Application	2021
106	Marine Desalinations for Life Rafts	2021
107	Absorption Type Air Conditioning System Based on Waste Heat Recovery	2021
108	24 Gigabit Ethernet switch	2021

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1648234>



“आत्मनिर्भर भारत” के लक्ष्य को हासिल करने की दिशा में डीआरडीओ ने उद्योग द्वारा डिजाइन, विकास और विनिर्माण के लिए 108 प्रणालियों और उप प्रणालियों की पहचान की

माननीय प्रधानमंत्री के “आत्मनिर्भर भारत” के आह्वान की प्रतिक्रिया में रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) ने स्वदेशी रक्षा विनिर्माण को मजबूती देने के लिए कई पहल की हैं। इस दिशा में, डीआरडीओ के एक प्रतिनिधिमंडल ने आज रक्षा मंत्री राजनाथ सिंह से मुलाकात की और उन्हें 108 प्रणालियों और उप प्रणालियों के बारे में बताया, जिनकी सिर्फ भारतीय उद्योग द्वारा डिजाइन और विकसित किए जाने के लिए पहचान की गई है। प्रौद्योगिकियों की सूची अनुलग्नक-क में दी गई है। इस पहल से भारतीय रक्षा उद्योग के लिए आत्मनिर्भर भारत के निर्माण की दिशा में कई तकनीक के विकास का मार्ग प्रशस्त होगा।

डीआरडीओ अपनी आवश्यकता के आधार पर इन प्रणालियों के डिजाइन, विकास और परीक्षण के लिए उद्योग को समर्थन भी उपलब्ध कराएगा। आरएंडडी प्रतिष्ठानों, सैन्य बलों और अन्य सुरक्षा एजेंसियों द्वारा इन प्रणालियों से जुड़ी सभी आवश्यकताएं उपयुक्त भारतीय उपक्रम के साथ विकास अनुबंध या उत्पादन ऑर्डर के माध्यम से पूरी की जा सकती हैं। इससे डीआरडीओ को महत्वपूर्ण और आधुनिक प्रौद्योगिकियों तथा प्रणालियों के डिजाइन और विकास पर ध्यान केन्द्रित करने में सहायता मिलेगी।

डीआरडीओ इन प्रणालियों की प्राप्ति के लिए उद्योग के साथ भागीदारी कर रहा है। प्रमुख शस्त्र प्रणालियों के विकास में डीआरडीओ के साथ सहयोग से भारतीय उपक्रम एक स्तर तक परिपक्व हो गए हैं, जहां वे अपने दम पर प्रणालियों का विकास कर सकते हैं। भारतीय उद्योग ‘बिल्ड टू प्रिंट भागीदार से ‘बिल्ड टू स्पेसिफिकेशन’ भागीदार में परिवर्तित हो चुका है।

डीआरडीओ के लिए वर्तमान उद्योग आधार में डीपीएसयू, आयुध कारखानों और बड़े उद्योगों के साथ ही 1,800 एमएसएमई शामिल हैं। डीआरडीओ पहले ही विकास सह उत्पादन भागीदारों (डीसीपीपी) के रूप में भारतीय उद्योग को जोड़ने के लिए विभिन्न नीतियों के माध्यम से कई पहल कर चुका है। साथ ही उद्योग को मामूली लागत पर तकनीक की पेशकश कर रहा है और अपने पेटेंट के लिए मुफ्त पहुंच उपलब्ध करा रहा है।

इस पहल से तेजी से उभरते भारतीय रक्षा उद्योग को समर्थन मिलेगा और उद्योग को बड़े स्तर पर “आत्मनिर्भर भारत” की दिशा में योगदान करने में सहायता मिलेगी।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1648298>



**"ఆత్మ నిర్భర్ భారత్" ను సాధించడానికి పరిశ్రమ రూపకల్పన, అభివృద్ధి మరియు తయారీకి 108 వ్యవస్థలు మరియు ఉపవ్యవస్థలను గుర్తించిన -
డి.ఆర్.డి.ఓ.**

"ఆత్మ నిర్భర్ భారత్" కోసం గౌరవ ప్రధానమంత్రి ఇచ్చిన స్పష్టమైన పిలుపుకు ప్రతిస్పందనగా, దేశీయ రక్షణ పర్యావరణ వ్యవస్థను బలోపేతం చేయడానికి రక్షణ పరిశోధన మరియు అభివృద్ధి సంస్థ (డి.ఆర్.డి.ఓ.) అనేక కార్యక్రమాలు చేపట్టింది. ఈ విషయమై, డి.ఆర్.డి.ఓ. ప్రతినిధి బృందం ఈ రోజు రక్షణ శాఖ మంత్రి శ్రీ రాజనాథ్ సింగ్ తో సమావేశమై, 108 వ్యవస్థలు మరియు ఉపవ్యవస్థల గురించి ఆయనకు తెలియజేస్తూ, ఇవి భారతీయ పరిశ్రమల రూపకల్పన మరియు అభివృద్ధి కోసం మాత్రమే గుర్తించబడ్డాయని పేర్కొన్నారు. ఈ సాంకేతికతల జాబితాను అనుబంధం-1 లో పొందుపరచడం జరిగింది. ఈ ప్రయత్నం, ఆత్మ నిర్భర్ భారత్ నిర్మాణానికి అవసరమైన అనేక సాంకేతిక పరిష్కారాలను అభివృద్ధి చేయడానికి వీలుగా, భారత రక్షణ పరిశ్రమకు, మార్గం సుగమం చేస్తుంది.

అవసరాల ఆధారంగా ఈ వ్యవస్థల రూపకల్పన, అభివృద్ధి మరియు పరీక్షల కోసం పరిశ్రమలకు డి.ఆర్.డి.ఓ. మద్దతు ఇస్తుంది. ఆర్ అండ్ డి సంస్థలు, సాయుధ దళాలు మరియు ఇతర భద్రతా సంస్థలకు అవసరమైన ఈ వ్యవస్థల యొక్క అన్ని అభివృద్ధి ఒప్పందాలు లేదా ఉత్పత్తి ఆర్డర్లను వాటికి తగిన భారతీయ పరిశ్రమల ద్వారా నెరవేర్చవచ్చు. క్లిష్టమైన మరియు అధునాతన సాంకేతికతలు మరియు వ్యవస్థల రూపకల్పన మరియు అభివృద్ధిపై దృష్టి పెట్టడానికి ఇది డి.ఆర్.డి.ఓ. ని అనుమతిస్తుంది.

డి.ఆర్.డి.ఓ. తన వ్యవస్థల వినియోగం కోసం పరిశ్రమలతో భాగస్వామ్యం కలిగి ఉంది. ప్రధాన ఆయుధ వ్యవస్థల అభివృద్ధిలో డి.ఆర్.డి.ఓ. తో సహకరించడం ద్వారా భారతీయ పరిశ్రమలు స్వయంగా వ్యవస్థలను అభివృద్ధి చేయగల దశకు చేరుకుంటున్నాయి. దీంతో, భారతీయ పరిశ్రమ రంగం 'బిల్ట్ టు ప్రింట్' భాగస్వామి నుండి 'బిల్ట్ టు స్పెసిఫికేషన్' భాగస్వామిగా అభివృద్ధి చెందింది.

డి.ఆర్.డి.ఓ. కి చెందిన ప్రస్తుత పారిశ్రామిక స్థావరంలో 1,800 ఎంఎస్.ఎం.ఈ. లతో పాటు డి.పి.ఎస్.యు. లు, ఆర్డినెన్సు ఫ్యాక్టరీలు మరియు పెద్ద ఎత్తున పరిశ్రమలు ఉన్నాయి. భారతీయ పరిశ్రమను అభివృద్ధితో కూడిన ఉత్పత్తి భాగస్వామి (డి.సి.పి.పి) గా చేర్చడానికి డి.ఆర్.డి.ఓ. ఇప్పటికే వివిధ విధానాల ద్వారా భారీ కార్యక్రమాలు చేపట్టింది, దాని సాంకేతికతను పరిశ్రమకు నామమాత్రపు ఖర్చుతో అందిస్తోంది. దాని పేటెంట్లను ఉచితంగా అందుబాటులో ఉంచుతోంది.

ఈ చోరవ వేగంగా అభివృద్ధి చెందుతున్న భారత రక్షణ పారిశ్రామిక పర్యావరణ వ్యవస్థకు తోడ్పడుతుంది, పరిశ్రమకు "ఆత్మనిర్భర్ భారత్" వైపు పెద్ద ఎత్తున తోడ్పడటానికి సహాయపడుతుంది.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1648316>

डीआरडीओ ने घरेलू उद्योगों के उत्पादन के लिए 108 सैन्य प्रणाली की पहचान की

नई दिल्ली: रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) ने घरेलू उद्योग के लिए डिजाइन, विकास और मैन्युफैक्चरिंग को लेकर नैविगेशन रडार, टैंक ट्रांसपोर्टर, फ्लोटिंग पुल समेत 108 सैन्य प्रणाली और उप-प्रणाली को चिन्हित किया है। रक्षा मंत्रालय ने कहा कि डीआरडीओ के एक उच्च स्तरीय प्रतिनिधिमंडल ने उत्पादों की सूची रक्षा मंत्री राजनाथ सिंह को सौंपी है।

मंत्रालय ने सोमवार को एक बयान में कहा कि डीआरडीओ अपनी आवश्यकता के आधार पर इन प्रणालियों के डिजाइन, विकास और परीक्षण के लिए उद्योग को सहायता भी उपलब्ध कराएगा। यह कदम सरकार के रक्षा क्षेत्र में आत्म निर्भर होने के लक्ष्य के अनुरूप है। डीआरडीओ ने प्रणाली और उप-प्रणाली के विकास के लिये अगले साल का लक्ष्य रखा है।

मंत्रालय ने एक बयान में कहा, "अनुसंधान एवं विकास प्रतिष्ठानों, सैन्य बलों और अन्य सुरक्षा एजेंसियों द्वारा इन प्रणालियों से जुड़ी सभी आवश्यकताएं उपयुक्त भारतीय उपक्रम के साथ विकास अनुबंध या उत्पादन ऑर्डर के माध्यम से पूरी की जा सकती हैं। इससे डीआरडीओ को महत्वपूर्ण और आधुनिक प्रौद्योगिकियों तथा प्रणालियों के डिजाइन और विकास पर ध्यान केन्द्रित करने में सहायता मिलेगी।

उल्लेखनीय है कि रक्षा मंत्री ने घरेलू रक्षा उद्योग को बढ़ावा देने के इरादे से दो सप्ताह पहले ही चरणबद्ध तरीके से 2024 तक 101 सैन्य प्रणाली और हथियारों के आयात पर पाबंदी लगाने की घोषणा की थी। इन प्रणालियों और हथियारों में ट्रांसपोर्ट एयरक्राफ्ट, हल्के लड़ाकू हेलीकॉप्टर, परंपरागत पनडुब्बी और क्रूज मिसाइल शामिल हैं।

इस घोषणा के बाद रक्षा मंत्रालय ने घरेलू रक्षा उद्योग को बढ़ावा देने के लिये कदम उठाने शुरू किये हैं। मंत्रालय ने रक्षा विनिर्माण क्षेत्र में अगले पांच साल में 25 अरब डॉलर (1.75 लाख करोड़ रुपये) के कारोबार का लक्ष्य रखा है। इसमें 5 अरब डॉलर (35,000 करोड़ रुपये) मूल्य का सैन्य हार्डवेयर का निर्यात शामिल हैं। मंत्रालय ने कहा, "प्रधानमंत्री के 'आत्मनिर्भर भारत के आह्वान के साथ रक्षा अनुसंधान एवं विकास संगठन ने स्वदेशी रक्षा विनिर्माण को मजबूती देने के लिए कई पहल की हैं।

बयान के अनुसार डीआरडीओ के लिए वर्तमान में उद्योग आधार में रक्षा क्षेत्र के सार्वजनिक उपक्रम, आयुध कारखानों और बड़े उद्योगों के साथ 1,800 एमएसएमई शामिल हैं। मंत्रालय ने कहा, डीआरडीओ पहले ही विकास सह उत्पादन भागीदारों (डीसीपीपी) के रूप में भारतीय उद्योग को जोड़ने के लिए विभिन्न नीतियों के माध्यम से कई पहल कर चुका है। साथ ही उद्योग को मामूली लागत पर तकनीक की पेशकश कर रहा है और अपने पेटेंट के लिए मुफ्त पहुंच उपलब्ध करा रहा है।

इस पहल से तेजी से उभरते घरेलू रक्षा औद्योगिक परिवेश को समर्थन मिलेगा और उद्योग को बड़े स्तर पर 'आत्मनिर्भर भारत की दिशा में योगदान करने में सहायता मिलेगी। डीआरडीओ ने जिन प्रणालियों और उप-प्रणालियों की सूची सौंपी है, उनमें नैविगेशन रडार, टैंक ट्रांसपोर्टर और मिसाइल कनस्तर के अलावा छोटे और सूक्ष्म आकार के यूएवी (ड्रोन), माउंटेन फुटब्रिज, मोइयूलर ब्रिज, फ्लोटिंग ब्रिज आदि शामिल हैं।

<https://www.livehindustan.com/national/story-drdo-identifies-108-military-systems-for-production-of-domestic-industries-3441061.html>

This is a self-imposed negative list: DRDO Chairman | India Today Insight

DRDO Chairman Dr G. Satheesh Reddy outlines the thinking behind the series of far-ranging moves to get his organisation to focus on advanced systems

By Sandeep Unnithan

Delhi: Among the criticisms levelled against the Defence Research and Development Organisation (DRDO) is that it has spread itself too thin, focusing on technologies that private players can easily develop instead of its core competence of developing strategic systems and cutting-edge technologies. On August 24, DRDO released a list of 108 systems and subsystems to be designed, developed and manufactured by Indian industry. These include mini and micro UAVs (unmanned aerial vehicles), cooled night vision sights, rocket launchers, torpedo tubes and NBC (nuclear, biological and chemical) shelters. It follows the 101 negative import list issued by the defence ministry on August 9, whereby the import of these items will be prohibited after a cut-off date.



DRDO Chairman Dr G. Satheesh Reddy.

In an interview with Executive Editor Sandeep Unnithan, DRDO Chairman Dr G. Satheesh Reddy outlines the thinking behind the series of far-ranging moves to get his organisation to focus on advanced systems.

1. Can this be called the DRDO's negative list, in that you will not develop any of these technologies but allow the private sector to do so?

SR: Yes, this is a negative list--it's a self-imposed negative list for the DRDO. These are the technologies we will support the industry to develop and come up with. We have been working on this list for the last three weeks. This is part of the many reforms that have been brought out. We will be bringing out many more such reforms in the days ahead.

2. The DRDO official release says, "This will allow DRDO to focus on design and development of critical and advanced technology and systems." Does this mean DRDO will exit from technologies deemed as non-core?

SR: As industry is coming up to a certain capability, we will keep adding more items to this list [of 108 items]. It is a continuous process. That is how [DRDO] will be able to focus on advanced systems.

3. Your release also says, "DRDO will provide support for industries." What kind of hand-holding will the organisation do?

SR: Wherever the industry has any design deficiency or is stuck, whatever help they want, I will give them, so that their products are up to the mark. I won't be doing Preliminary Design Report (PDR) and Critical Design Review (CDR) in my labs. I will only help them to come out if testing support is required. I will help them with quality control, end production inspection, acceptance tests in all these things, we will support them. We have to help (Indian industry). Whatever you say, the reality is that our country's industrial ecosystem is yet to grow up in the way that we want it to. That is why we used the sentence 'we have to support' industry.

4. Will the DRDO allow industry to utilise its laboratories and testing facilities etc?

SR: We are actually issuing orders to use all our facilities for industry. Wherever available, industry will use all our facilities. We are looking primarily at opening up our test facilities and some infrastructure.

5. Will more items be added to this list for industry to design, develop and manufacture?

SR: Definitely. We want to add more items to this list in the days ahead.

<https://www.indiatoday.in/india-today-insight/story/this-is-a-self-imposed-negative-list-drdo-chairman-1714689-2020-08-25>

hindustantimes

Tue, 25 Aug 2020

DRDO sets an ambitious 2021 target for 108 defence items at meeting with Rajnath Singh

DRDO has handed over a list of 108 systems and subsystems to be produced in India by end of 2021

New Delhi: Days after the government announced a policy change to encourage self-reliance in the defence sector, a Defence Research and Development Organisation team on Monday told the government that 108 systems and subsystems would be delivered by the Indian industry within the next 18 months. The list of 108 items that the industry would design, develop and manufacture was handed over to Defence Minister Rajnath Singh by DRDO secretary Dr G Satheesh Reddy.

“This initiative will pave the way for Indian Defence industry to develop many technologies towards building an AtmaNirbhar Bharat,” defence minister Rajnath Singh tweeted after the meeting with the DRDO delegation.

Singh said he had been apprised about the systems and subsystems that had been identified for development by Indian industry. The list, reviewed by HT, includes mini and micro UAVs, mine laying and marking equipment, armoured engineering reconnaissance vehicle and fuel system components for aircrafts.

“The DRDO will provide its support to industries in this development process,” the minister said.

Of the 108 items, 68 items would be developed before the end of this year. The remaining 40 items are targeted to be manufactured by the end of 2021.

The government had earlier this month gone public with plans to restrict imports in the defence sector over the next five years, putting out a list of 101 items that would to be produced within the country by 2024. Singh had then made it clear that the embargo on imports would kick in between 2020 and 2024.

The decision was taken in consultation with the defence industry. The list of weapons and systems to be placed on the restricted import list includes artillery guns, missile destroyers, ship-borne cruise missiles and long-range land attack cruise missiles.

<https://www.hindustantimes.com/india-news/drdo-sets-an-ambitious-2021-target-for-108-defence-items-at-meeting-with-rajnath-singh/story-mbq2pdS5yivyQv3aLeoXuM.html>



DRDO has apprised Defence Minister Rajnath Singh about the strict timelines that the research organisation has worked out for development of 108 systems and subsystems.(PTI)

DRDO identifies 108 military systems for production by domestic industry

DRDO has identified 108 military systems and subsystems like navigation radars, tank transporters and missile canisters for the domestic industry to design, develop and manufacture

New Delhi: India's premier defence research institute DRDO has identified 108 military systems and subsystems like navigation radars, tank transporters and missile canisters for the domestic industry to design, develop and manufacture.

The list of the items was handed over to Defence Minister Rajnath Singh by a high-level delegation from the Defence Research and Development Organisation (DRDO), the defence ministry said.

It said the DRDO will also provide support to industries for design, development and testing of these systems on a requirement basis, adding the initiative is in sync with the government's focus on achieving self-reliance in the defence sector.



The DRDO has set a target of next year for developing the systems and subsystems

"All the requirements of these systems by R&D establishments, armed forces, and other security agencies can be met through development contracts or production orders on suitable Indian industry. This will allow DRDO to focus on the design and development of critical and advanced technologies and systems," the ministry said in a statement.

Two weeks back, the defence minister announced a ban on import of 101 military systems and weapons like transport aircraft, light combat helicopters, conventional submarines and cruise missiles in a staggered manner by 2024 to promote India's domestic defence industry.

Following the announcement, the defence ministry has initiated a series of measures to promote the domestic defence industry.

The ministry has set a goal of a turnover of USD 25 billion (Rs 1.75 lakh crore) in defence manufacturing in the next five years that included an export target of USD 5 billion (Rs 35,000 crore) worth of military hardware.

"Responding to the clarion call given by the Prime Minister for Atmanirbhar Bharat (self-reliant India), the DRDO has taken several initiatives to strengthen the indigenous defence ecosystem," the ministry said.

It said the present industry base for DRDO consists of 1800 MSMEs along with defence public sector undertakings, Ordnance Factories and large scale industries.

"DRDO has already taken major initiatives through various policies to involve Indian industry as development cum production partners (DcPP), offering its technology to industry at nominal cost and providing free access to its patents," the ministry said.

"This initiative will support the fast-growing Indian defence industrial ecosystem and will help the industry to contribute towards 'Atmanirbhar Bharat' in a big way," it added.

The list of items identified by the DRDO for domestic production included mini and micro UAVs, mountain footbridge, modular bridge, mines laying and marking equipment, armoured engineering reconnaissance vehicle and anti-terrorist vehicle (ATV).

It also comprised tank transporter, missile canisters, missile storage container, marine rocket launcher, satellite navigation receivers, navigation radars, high nitrogen steel among others.

The timeline for developing some of the systems and subsystems has been mentioned as 2020.

(Only the headline and picture of this report may have been reworked by the Business Standard staff; the rest of the content is auto-generated from a syndicated feed.)

https://www.business-standard.com/article/defence/drdo-identifies-108-military-systems-for-production-by-domestic-industry-120082401469_1.html



Tue, 25 Aug 2020

Tests of increased-range BrahMos cruise missiles set for 2020

Earlier this summer, BrahMos's air-based modification, BrahMos-A, was successfully certified in India, the Tactical Missiles Corporation JSC CEO recalled

Kubinka /Moscow Region/, August 24. /TASS/. Tests of several modifications of the Russian-Indian BrahMos cruise missiles with extended range are planned for 2020, Tactical Missiles Corporation (TMC) JSC CEO Boris Obnosov told TASS Monday.

"Tests of BrahMos modifications with increased range planned for this year," he said at the Army-2020 international military forum.

Earlier this summer, BrahMos's air-based modification (BrahMos-A) was successfully certified in India, Obnosov noted.

"Quite recently, on June 10, the air-based supersonic cruise missile obtained its first permission for use, provided by India's CEMILAC certification agency. All specifications for the Indian Air Force have been confirmed. The BrahMos has become the first Indian aviation missile to obtain this permission," the TMC CEO said.

According to Obnosov, the BrahMos-A air-based cruise missile will significantly increase capabilities of the Indian Air Force.

"The BrahMos's launch range to the target is 300 km, while Su-30MKI jet fighter's range with air refueling is over 3,000 km - together, this provided [Indian] Air Force with a huge advantage in their actions in the Indian Ocean zone," Obnosov noted.

The CEO highly praised the work of the Russian-Indian BrahMos Aerospace joint venture. "This rapidly developing joint venture is one of the best examples of military-technical cooperation," he underscored.

<https://tass.com/defense/1193189>



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Ready to look at military option if talks don't resolve border standoff with China: CDS Rawat

Gen Rawat, who has been part of the top military brass strategising on the Sino-India border issue, said a 'whole of government' approach is being followed to peacefully resolve the row

New Delhi: India's armed forces are prepared to look at any military option if the extensive talks to restore status quo ante along the Line of Actual Control (LAC) did not yield any positive result, Chief of Defence Staff (CDS) Gen Bipin Rawat has said on the prolonged border standoff with China in eastern Ladakh.

Gen Rawat, who has been part of the top military brass strategising on the Sino-India border issue, said a "whole of government" approach is being followed to peacefully resolve the row.

The armed forces are always prepared for military actions if all efforts to restore status quo ante along the LAC don't "fructify," the CDS said when asked about the over three-month-long border row.

Gen Rawat, who was the Chief of Army Staff from December 2016 to December 2019, said the transgressions take place along the LAC because of varying perceptions about it by the two countries.

India and China have held several rounds of military and diplomatic talks in the last two-and-half months but no significant headway has been made for a resolution to the border standoff.

On Thursday, the two sides held another round of diplomatic parleys following which the Ministry of External Affairs (MEA) said they had agreed to resolve outstanding issues in an "expeditious manner" and in accordance with the existing agreements and protocols.

Defence Minister Rajnath Singh, Gen Rawat and the three service chiefs are regularly meeting to review India's military preparedness in eastern Ladakh as well as to take measures in sync with the evolving situation in the region.

At the military talks, the Indian Army has been strongly insisting that restoration of the status quo ante of April this year by China is the only way to resolve the row, according to government sources.

There is a growing view in the Army that the Chinese military is not serious about the resolution of the border conflict as it is resorting to "back and forth" negotiations while the Indian side has very clearly conveyed about its position on the matter.

Sources said notwithstanding the border row, India has been carrying on with the work on laying new roads in the Ladakh region besides developing other key infrastructure.

"Our road construction is not in response to PLA infrastructure development but based on our requirements and those of our people," said a source.



CDS Bipin Rawat (File Photo | Shekhar Yadav, EPS)

The formal process of disengagement of troops began on July 6, a day after a nearly two-hour telephonic conversation between National Security Advisor Ajit Doval and Chinese Foreign Minister Wang Yi on ways to bring down tensions in the area.

However, the process has not moved forward since mid-July.

The PLA has pulled back from Galwan Valley and certain other friction points but the withdrawal of troops has not moved forward in Pangong Tso, Depsang and a couple of other areas, sources said.

In the five rounds of Corps commander-level talks, the Indian side has been insisting on complete disengagement of Chinese troops at the earliest, and immediate restoration of status quo ante in all areas of eastern Ladakh prior to April.

Even as both sides are engaged in diplomatic and military talks, the Indian army is making elaborate preparations to maintain its current strength of troops in all key areas in eastern Ladakh in the harsh winter months.

Chief of Army Staff Gen MM Naravane has already conveyed to all the senior commanders of the Army, overseeing operation of the frontline formations along the LAC, to maintain a significantly high state of alertness to deal with any Chinese "misadventure", the sources said.

The Army is also in the process of procuring a number of weapons, ammunition and winter gears for the frontline troops, they added.

The temperature in some of the high-altitude areas along the LAC drops to minus 25 degree celsius in the winter months.

The tension between the two sides escalated manifold after the violent clashes in Galwan Valley on June 15 in which 20 Indian Army personnel were killed.

The Chinese side also suffered casualties but it is yet to give out the details.

According to an American intelligence report, the number of casualties on the Chinese side was 35.

<https://www.newindianexpress.com/nation/2020/aug/25/ready-to-look-at-military-option-if-talks-dont-resolve-border-standoff-with-china-cds-rawat-2187938.html>



Tue, 25 Aug 2020

It is time to accept that India's defence planning is crippled by severe financial woes

The prevailing chasm in India's military capability is so expansive and the armed forces' requirement so enormous that no enhancement in outlay will ever be enough

By Amit Cowshish

Stung by China's chicanery along the Line of Actual Control (LAC) in Ladakh, that resulted in a savage clash in Galwan valley on June 15 in which 20 Indian soldiers died, the Ministry of Defence (MoD) has gone into overdrive, clearing procurement of materiel worth billions of rupees.

On July 2, the MoD approved acquisition of an assortment of missiles, software defined radios, 33 fighters from Russia, apart from the proposal to upgrade BMP infantry combat vehicles, all for an estimated Rs 389 billion.

A raft of proposals initiated alongside include the import of 72,000 Sig 916 assault rifles from the US, six Boeing P-8I Neptune long-range maritime multi-mission aircraft, six Predator-B armed drones, 200 Spike anti-tank guided missiles, and 20 launchers.

Heron Unmanned Aerial Vehicles (UAVs), loitering munitions, man-portable surface-to-air missiles, besides a varied range of other ammunition, mostly from the US and Israel, complete the list of the planned military buys.

Reviving a decade-old project, MoD has also approved the emergency procurement of lightweight tanks, suitable for high-altitude conditions where the deployment of T-90s and T-72M1 main battle tanks is operationally cumbersome and transporting them to Ladakh by Indian Air Force transporters cost-prohibitive.

There is no denying that we are poised for a prolonged stand-off with the Chinese military, and regardless of how it pans out, the Indian troops will need to maintain a formidable and permanent presence along the LAC during and after the upcoming winter months. Viewed against this backdrop, the surge in procurement approvals is understandable, but it also raises more fundamental questions about defence planning.

Without amplifying the mortifying saga of Indian defence planning, its complications can be concisely thus summarised: there is – and has never been – an overarching planning organisation in the MoD capable of formulating financially viable and composite plans, including the military materiel procurement plans, and to oversee their implementation.

What we have instead are jerky, financially unviable, and disjointed plans for the armed forces and other organisations like the Border Roads Organisation and the Indian Coast Guard.

Logically, composite defence planning must encompass all the myriad organisations administered by the MoD, instead of being confined strictly to the services. This is the only way of ensuring that the plans are financially viable, and every organisation works in tandem to achieve the common goals.

The 13th five-year plan (2017-22) presented at the United Commanders' Conference in July 2017, for instance, envisaged an outlay of Rs 26.85 trillion, excluding some important elements like the outlay on defence pensions which has doubled over the past one decade. This would have necessitated more than doubling of the defence budget to finance the plan which would be a virtual impossibility.

This was not the first instance of its kind. It is well documented that the 11th defence five-year plan (2007-12) got grounded because the outlay envisaged by the planners was much beyond what the Ministry of Finance (MoF) considered feasible. For the 12th plan, MoF's consent was not even sought.

Thereafter, probably to give defence planning a fresh start, the federal government constituted a high-powered Defence Planning Committee (DPC) in April 2018, to facilitate the formulation of a comprehensive 15-year integrated perspective plan for India's military.

Other than addressing defence diplomacy issues, the DPC was also tasked to prepare the National Security Strategy and a capability development plan, focussing on improving the military manufacturing ecosystem in India, defence acquisitions and overall infrastructure development.

The DPC was swift in setting up four sub-committees on policy and strategy, plans and capability development, defence diplomacy and defence manufacturing ecosystem. Regrettably, nothing has been heard from any of these committees since. That seemingly was the DPC's last hurrah, after which silence has prevailed.

Chaired by the National Security Advisor, with the service chiefs, defence, expenditure and foreign secretaries as its members, and the Chief of Integrated Defence Staff as member-secretary, it was touted as a panacea for all ills besetting India's defence planning.

But soon this was nudged aside by the newly appointed Chief of Defence Staff and the Department of Military Affairs he was to head. Hence, the CDS was now handed the responsibility of joint military planning in all its financial, operational, training, and organisational aspects. This, it seems, is still a work in progress.

Because of the defence establishment's compulsive obsession with confidentiality, it is difficult to evaluate what the DPC has to show for its labours over the last two years. It is also not known

what goals the previous and the current defence plans had set themselves and what was eventually achieved.

If anything, the current spurt in approvals for materiel procurement seems to indicate a panicky response to the military situation on the northern borders with China. Even basics like winter clothing seem not to have been catered for, and dependence on foreign vendors for these essential items continues apace.

Eventually, it may end up as a case of too little, too late, as delivery of a large proportion of the proposed weapon systems and platforms will take at least a couple of years to be completed; their induction and deployment thereafter will take even more time. This is a sad commentary on the state of defence planning.

Ironically, the procurement history of 1962, when India fought a disastrous border war with China and in 1999 when it battled Pakistan in the Kargil mountains, seems to be repeating itself, ably validating George Bernard Shaw's quip: 'If history repeats itself, and the unexpected always happens, how incapable must Man be of learning from experience.'

More worryingly, the procurements now being processed by the MoD, largely from overseas vendors or involving indigenous licensed manufacturing, could also restrict the financial space for future defence planning.

It is difficult, if not impossible for now, to tabulate the total cost of procurements approved over the past month as well as the recurring expenditure on transportation, habitation and winter stocking for additional troops being stationed in Ladakh. But there is little doubt that it will be astronomical, and without doubt necessitate an exponential hike in defence spending, far in excess of what has been the recent trend.

It is also not known if MoD has done its math, factoring in the long-term economic impact of the enduring COVID-19 pandemic on one hand and the rising cost of salaries and pensions on the other. In all likelihood, it has not.

Rhetorical claims that adequate funding will not be a handicap in the country's defence preparedness ring hollow in face of the escalating gap between the requirements projected by the services and the actual allocation. Over the past decade, this has widened to Rs 1.03 trillion from Rs 230 billion, registering almost a fourfold hike.

In an unusual move in July 2019, the government opted to amend the terms of reference of the 15th Finance Commission by requiring it to address concerns over the inadequacy of funds for defence and internal security.

The Finance Commission's constitutional mandate, however, is to recommend equitable distribution of tax revenues between the Union and the states, and further amongst the states themselves. Its remit by no means extends to advising the government on how to improve its revenues, which is what fundamentally besets defence planning.

The prevailing chasm in India's military capability is so expansive and the armed forces' requirement so enormous that no enhancement in outlay will ever be enough. At any rate, the extent of increase will always be circumscribed by the government's ability to generate additional revenue primarily through taxation, borrowings, and disinvestment.

There is no shame in acknowledging that the government revenues will always be finite and susceptible to equally pressing requirements of other public sectors like health, education, and infrastructure. The unvarnished truth is that the government cannot allocate more funds for defence or other sectors if it simply does not have enough money to distribute.

This zero-sum game of resource allocation renders it difficult, if not impossible, to service defence plans premised on unrealistic financial assumptions. This reality cannot be wished away by making ostentatious promises of more funds for defence. Fine words butter no parsnips.

(Amit Cowshish is former Financial Advisor (Acquisitions), Ministry of Defence.)

<https://thewire.in/security/india-defence-planning-procurement-finance-ministry>

China building a surrogate force on India's western border

Edited By Palki Sharma

Story highlights

The missile frigate called the backbone of the Chinese naval forces. China is arming Pakistan with the same weapons that it uses.

New Delhi: Far away from the border hostilities, militaries of India, China and Pakistan will be carrying out drills together in Russia next month.

China on Sunday has launched the first of four most advanced warships it is building for Pakistan amid deepening military and strategic ties with Islamabad.

The Type 054A/P, a guided missile frigate, is the largest combat ship China has sold to a foreign navy.

China is building these four most sophisticated naval platforms at a Chinese shipyard in Shanghai.

According to reports, each ship is worth 350 million dollars.

The cash strapped Pakistan is not able to pay for it but despite Pakistan's poor credit ratings China is more than willing to supply weapons to the Pakistani defence forces.

The missile frigate called the backbone of the Chinese naval forces. China is arming Pakistan with the same weapons that it uses. Reports say the frigate comes equipped with modern weapons and sensors.

It can conduct anti-ship, anti-submarine and air-defence operations.it can multiply the combat capabilities of the Pakistani naval fleet.

This frigate is roughly the same size as the Indian navy's existing Talwar frigates. The ones that India bought from Russia.

China is building a surrogate force on India's western border. A force armed with Chinese weapons and ready to do China's bidding. Pakistan is part of China's belt and road initiative.

With its mounting debt, it is a vassal state of China and now, a vital component in China's string of pearls.

China's string of pearls is a network of ports and military assets to surround India from all sides. Stretching from Djibouti in Africa — to Myanmar in the east, China has been building assets. China denies claims that it wants to militarize these ports but at least — two ports on this map, are already militarised.

Djibouti is China's first overseas military base. It has an estimated area of nearly 250 thousand square feet. The base is capable of hosting 10 thousand troops. Once china announced the Djibouti base — its intention was quite clear. Beijing wants a blue water navy — that can operate outside the immediate neighbourhood of China.

And now — it seems like the Gwadar base in Pakistan is going the Djibouti way. A satellite has caught what looks like a high-security compound at the Gwadar port.

Now, there are clear takeaways for India, one — China and Pakistan are stepping up their military ties. Two, this is an attempt to challenge India in every military theatre.

<https://www.wionews.com/india-news/china-building-a-surrogate-force-on-indias-western-border-322850>



File photo of Pakistan's Prime Minister Imran Khan and his Chinese counterpart Xi Jinping. Photograph:(Reuters)

India's answer to China-backed Thai Canal plan is a huge military upgrade in islands

China will be one of the biggest beneficiaries of the Thai Canal project, aka Kra Canal, that will give Beijing an alternative route to the congested Malacca Strait

By Shishir Gupta

New Delhi: With Chinese Navy positioning itself for dominance in the Indian Ocean through strings of ports in Myanmar, Pakistan and Iran, India is planning rapid infrastructure upgrade in its Island territories to ensure that there is no restriction on navigation or a replay of the South China Sea in Indian backyard.

According to top military officials, India will upgrade the airstrip at INS Kohassa, Shibpur in north Andamans and at the Campbell strip at Nicobar into full-fledged fighter bases. The airstrip at Agatti, in Lakshadweep will also be upgraded for military operations to secure both the Bay of Bengal upto Malacca Straits and Arabian Sea up to Gulf of Aden.



The Kra Canal that will slice through Thailand is expected to alter the strategic calculus in the region and has nudged India to upgrade its infrastructure in its island(Carrier Strike Group 11)

“The two Island territories will be like the new aircraft carriers for India, extending the navy’s reach in the region far from the mainland. Both the Islands sit on the busiest sea lanes of the world with more than half the world trade going through this route,” said a tri-service commander.

Lakshadweep sits on the Nine Degree Channel, so named because it lies on the 9-degree line of Latitude, north of the equator. The Andamans and Nicobar Islands will allow the navy to dominate the Six Degree and Ten Degree Channels towards Southeast Asia and North Asia.

Officials said the infrastructure upgrade had also acquired urgency due to efforts by China, much of it backroom, to get Thailand to start work on the Thai Canal aka Kra Canal that has been on the drawing board for the last 70 years. The canal has been proposed to slice through the Malay peninsula some 800 km south of Bangkok and connect the Gulf of Thailand with the Andaman Sea.

It would let ships bypass the choked Malacca Strait, the main shipping channel between the Indian Ocean and the Pacific Ocean that has become the world’s busiest trade route. For ships passing between the Indian and Pacific Oceans, it would shorten the distance by at least 1,200 km.

There is no unanimity in India’s strategic community on the approach to the Kra canal. One view is that the canal, promoted by China under its Belt and Road Initiative, would pose a risk to India’s long-term maritime security but there is an influential section that sees the construction of the Thai Canal as inevitable given the money China is believed to be throwing at powerful elements in Bangkok.

Like when Thailand was to decide on setting up an ad-hoc committee to carry out a study earlier this year, there were raised eyebrows at how Thailand’s fragmented political class demonstrated unprecedented unity in supporting the move. Even parties that are known to be anti-China had ended up supporting the canal. The Thai King, however, is still opposed to the Kra Canal.

National security planners believe that India should capitalise on the opportunity - bundled with its own set of challenges - that the Kra Canal offers and offer transshipment ports to vessels bound for either Malacca or Kra Canal. As of now, ships wait for their turn at Sri Lankan ports, earning Colombo precious foreign exchange as well as leverage.

It is argued that the infrastructure upgrade in the island territories would serve twin objectives: one, enable India to maximise the economic gains as well as raise its military presence in the Indian Ocean Region.

The continuing focus on the infrastructure upgrade also comes against the backdrop of China's aggressive moves in Ladakh and its reluctance to restore status quo ante. The Chinese aggression has not only prompted New Delhi to reinforce force deployment along hotspots along the LAC but also in the high seas.

The Indian Navy is on high alert from the Persian Gulf to the Malacca Strait in the context of the standoff with China. The instructions to the navy are clear: That they should be prepared for military action if China mounts an attack along the Line of Actual Control, people familiar with the matter said.

Indian military officials stressed that the upgradation of air bases in the Island territories would ensure that China's People's Liberation Army Navy under its President and commander in chief Xi Jinping, does not dominate the area to extract leverage from all countries in the region.

For now, the United States earlier this month flew in its three B-2 stealth bombers to the naval support facility in Diego Garcia in the south Indian Ocean to support the Pacific Air Forces' Bomber Task Force to deter China from flexing its muscles in the region. Around the same time, the US decided to sell 66 new American-made F-16 fighter jets in the biggest arms sale to the island, a democracy of 24 million people that Beijing claims to be an inseparable part of its territory.

A few days later, the United States also moved aircraft carrier Ronald Reagan and its strike group for maritime air defence operations to the restive South China Sea. The US Navy said the training said the Carrier Strike Group participated in cooperative sea drills with the Air Force's B-1B Lancer to improve "joint readiness response capabilities. The US Navy said the units conducted air-to-air operations, combat search and rescue drills and air defence exercises, according to the Navy.

Building pressure on China

- USS Ronald Regan - The US Navy's aircraft carrier Ronald Regan and its strike group recently returned to the South China Sea to carry out air operations to demonstrate, what the navy called, the US' enduring commitment to allies and partners.
- B-2 Bombers - The US Air Force has deployed three B-2 Spirit Stealth Bombers to its naval facility in Diego Garcia in the Indian Ocean. The heavy strategic bomber has the ability to deliver lethal, ready, long-range strike options.
- 66 F-16 jets for Taiwan - Taiwan has signed a pact to buy 66 latest F-16s from the United States, the first sale of advanced fighter jets to the island since then US President George Bush cleared 150 F-16s in 1992.

<https://www.hindustantimes.com/india-news/china-s-thai-canal-project-propels-india-to-upgrade-military-infra-in-a-n-lakshadweep/story-EcDEGU2XXGwdJmRNwm4LN.html>

India, China, Pakistan to participate in military exercise in Russia next month

An Indian military contingent will take part in "Kavkaz 2020" ("Caucasus 2020"), strategic command-post exercise next month where various countries, including China and Pakistan, will also take part

By Abhishek Bhalla

New Delhi: Far away from the border hostilities, militaries of India, China and Pakistan will be carrying out drills together in Russia next month.

An Indian military contingent will take part in "Kavkaz 2020" ("Caucasus 2020"), strategic command-post exercise next month where various countries, including China and Pakistan, will also take part.

The Indian contingent would include around 180 troops and officers from across infantry, artillery, mechanised, and armoured forces along with Special Forces, air defence and signals. The contingent would also include personnel from the Indian Navy and the Indian Air Force (IAF).



File image for representation.

Sources said China is sending an army contingent and three ships as part of its naval deployment to the exercise.

The exercise to be held next month will include 19 countries including host Russia where over 12,500 troops will participate.

Other than the Shanghai Cooperation Organisation (SCO) members, that include India, China, Pakistan, Russia, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan, 11 other countries will be part of the exercise. The other nations included in the drills are Mongolia, Syria, Iran, Egypt, Belarus, Turkey, Armenia, Abkhazia, South Ossetia, Azerbaijan and Turkmenistan.

The exercise will be held in Astrakhan region of South Russia between September 15 and 26.

The aim and scope of the exercise is to improve cooperation. The idea is for militaries to prepare for joint action with units of armies of foreign states.

All participating nations will be required to strictly follow Covid-19 protocols. After a Covid test, the participants will spend 14 days preceding the departure in quarantine and will be tested again on arrival in Russia.

The joint exercise is of immense significance as it comes amid the over three-month-long standoff between India and China at the Line of Actual Control (LAC). Despite several levels of dialogue, there has not been a breakthrough and the deadlock continues.

There have been several clashes between Indian and Chinese troops without the use of firearms and 20 Indian soldiers were killed in one of such melees in Galwan on June 15. There were casualties on the Chinese side but those were not made public by the People's Liberation Army (PLA) of China.

Other than the tensions with China, Indian and Pakistani armies have been involved in frequent skirmishes at the Line of Control (LoC).

<https://www.indiatoday.in/india/story/india-china-pakistan-to-participate-in-military-exercise-in-russia-next-month-1714685-2020-08-25>

China launches warship for Pakistan Navy

Pakistan-China defence ties turn a new chapter with the launch of the first ship of Type-054 class frigate, Pakistan's state-run APP news agency reported

Beijing/Islamabad: China has launched first of the four advanced naval warships it is building for Pakistan, amid deepening defence ties between the two all-weather allies.

The launching ceremony for the first warship was held at the Hudong Zhonghua Shipyard in Shanghai on Sunday.

Pakistan-China defence ties turn a new chapter with the launch of the first ship of Type-054 class frigate, Pakistan's state-run APP news agency reported.

The Type-054 class, equipped with the latest surface, subsurface, anti-air weapons, combat management system, and sensors, will be one of the technologically advanced surface platforms of the Pakistan Navy fleet, the report said.

Pakistan signed a contract with the China Shipbuilding Trading Company Ltd. (CSTC) for the delivery of two Type-054 A/P frigates in 2017. Last year, the Chinese official media reported that China would build four advanced frigates for Pakistan Navy.

The launching of the ship coincided with the second strategic dialogue between Foreign Minister of China Wang Yi and his Pakistani counterpart Shah Mahmood Qureshi at the Chinese holiday resort of Hainan on August 21.

<https://www.thehindu.com/news/international/china-launches-warship-for-pakistan-navy/article32432221.ece>



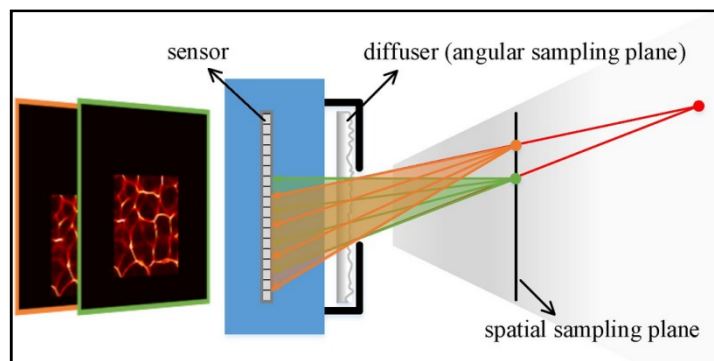
Type-054 class will be an advanced surface platform of the Pakistan Navy.

Lensless light-field imaging through diffuser encoding

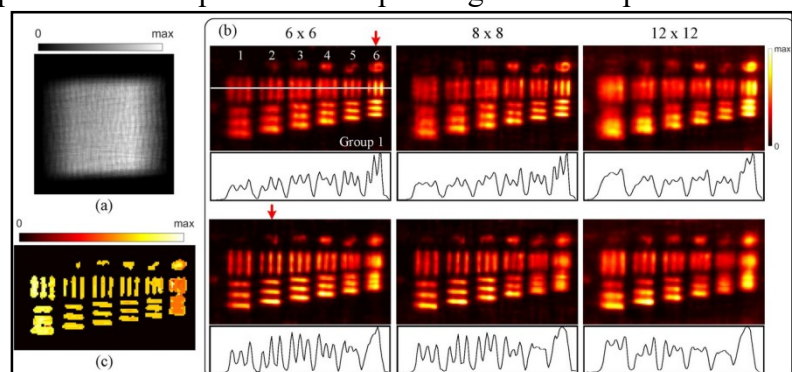
Light-field imaging can detect both spatial and angular information of light rays. The angular information offers peculiar capabilities over conventional imaging, such as viewpoint shifting, post-capture refocusing, depth sensing, depth-of-field extension, etc. The concept of plenoptic cameras by adding a pinhole array or microlens array was proposed more than a century ago. Nowadays, microlens array based plenoptic cameras are commonly used for light-field imaging, such as the commercially available products, Lytro and Raytrix. However, these devices confront a trade-off between the spatial and angular resolutions; the spatial resolution is in general tens to hundreds times smaller than the number of pixels used.

In a new paper published in *Light Science & Applications*, a team of scientists from College of Physics and Optoelectronic Engineering, Shenzhen University, China and Institut für Technische Optik, Universität Stuttgart, German have developed a novel modality for computational light-field imaging by using a diffuser as an encoder, without needing any lens. Through the diffuser, each sub-beam directionally emitted by a point source in the detectable field-of-view forms a distinguishable sub-image that covers a specific region on the sensor. These sub-images are combined into a unique pseudorandom pattern corresponding to the response of the system to the point source.

Consequently, the system has the capability of encoding a light field incident onto the diffuser. We establish a diffuser-encoding light-field transmission model to characterize the mapping of four-dimensional light fields to two-dimensional images, where a pixel collects and integrates contributions from different sub-beams. With the aid of the optical properties of the diffuser encoding, the light-field transmission matrix can be flexibly calibrated through a point source generated pattern. As a result, light fields are computationally reconstructed with adjustable spatio-angular resolutions, avoiding the resolution limitation of the sensor.



A diffuser is placed at a small distance in front of a sensor so that a temporally incoherent point source in the detectable field-of-view generates a high-contrast pseudorandom pattern. The elementary sub-beams, represented by their center light rays, are angularly encoded in the pattern. Credit: Zewei Cai, Jiawei Chen, Giancarlo Pedrini, Wolfgang Osten, Xiaoli Liu, and Xiang Peng



a, A raw image was captured by the system. b, Light fields in different spatio-angular samplings were reconstructed from the captured image. Respective focal stacks were then obtained from these reconstructed light fields by performing digital refocusing. c, By using the focal stack, the depth of the measured object was estimated. Credit: Zewei Cai, Jiawei Chen, Giancarlo Pedrini, Wolfgang Osten, Xiaoli Liu, and Xiang Peng

The researchers constructed an experimental system using a diffuser and a sensor. The system was demonstrated for distributed object points and area objects, which shows the object-dependent performance of the computational approach. The performance regarding the spatio-angular samplings and measured objects was further analyzed. After that, these scientists made a summary of their approach:

"The improvement of the proposed methodology over the previous work on diffuser-encoding light-field imaging mainly lies in two aspects. One is that our imaging modality is lensless and thus is compact and free of aberration; the other is that the system calibration and decoupling reconstruction become simple and flexible since only one pattern generated by a point source is required," they note

"Based on this single-shot lensless light-field imaging modality, light rays, viewpoints, and focal depths can be manipulated and the occlusion problem can be tackled to some extent. This allows to further investigate the intrinsic mechanism of the light-field propagation through the diffuser. It is also possible to transform the diffuser-encoding light-field representation into the Wigner phase space so that the diffraction effect introduced by the internal tiny structure of the diffuser can be taken into account and lensless light-field microscopy through diffuser encoding may be developed," the scientists conclude.

More information: Zewei Cai et al, Lensless light-field imaging through diffuser encoding, *Light: Science & Applications* (2020). DOI: [10.1038/s41377-020-00380-x](https://doi.org/10.1038/s41377-020-00380-x)

Journal information: [Light: Science & Applications](https://phys.org/news/2020-08-lensless-light-field-imaging-diffuser-encoding.html)
<https://phys.org/news/2020-08-lensless-light-field-imaging-diffuser-encoding.html>



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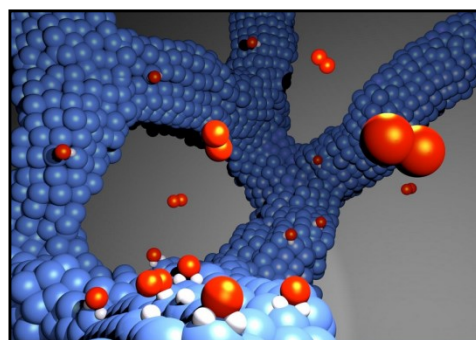
Fuel cells for hydrogen vehicles are becoming longer lasting

Roughly 1 billion cars and trucks zoom about the world's roadways. Only a few run on hydrogen. This could change after a breakthrough achieved by researchers at the University of Copenhagen. The breakthrough? A new catalyst that can be used to produce cheaper and far more sustainable hydrogen powered vehicles.

Hydrogen vehicles are a rare sight. This is partly because they rely on a large amount of platinum to serve as a catalyst in their fuel cells—about 50 grams. Typically, vehicles only need about five grams of this rare and precious material. Indeed, only 100 tons of platinum are mined annually, in South Africa.

Now, researchers at the University of Copenhagen's Department of Chemistry have developed a catalyst that doesn't require such a large quantity of platinum.

"We have developed a catalyst which, in the laboratory, only needs a fraction of the amount of platinum that current hydrogen fuel cells for cars do. We are approaching the same amount of platinum as needed for a conventional vehicle. At the same time, the new catalyst is much more stable than the catalysts deployed in today's hydrogen powered vehicles," explains Professor Matthias Arenz from the Department of Chemistry.



The new electrocatalyst for hydrogen fuel cells consists of a thin platinum-cobalt alloy network and, unlike the catalysts commonly used today, does not require a carbon carrier. Credit: Gustav Sievers

A paradigm shift for hydrogen vehicles

Sustainable technologies are often challenged by the limited availability of the rare materials that make them possible, which in turn, limits scalability. Due to this current limitation, it is impossible to simply replace the world's vehicles with hydrogen models overnight. As such, the new technology a game-changer.

"The new catalyst can make it possible to roll out hydrogen vehicles on a vastly greater scale than could have ever been achieved in the past," states Professor Jan Rossmeisl, center leader of the Center for High Entropy Alloy Catalysis at UCPH's Department of Chemistry.

The new catalyst improves fuel cells significantly, by making it possible to produce more horsepower per gram of platinum. This in turn, makes the production of hydrogen fuel cell vehicles more sustainable.

More durable, less platinum

Because only the surface of a catalyst is active, as many platinum atoms as possible are needed to coat it. A catalyst must also be durable. Herein lies the conflict. To gain as much surface area as possible, today's catalysts are based on platinum-nano-particles which are coated over carbon. Unfortunately, carbon makes catalysts unstable. The new catalyst is distinguished by being carbon-free. Instead of nano-particles, the researchers have developed a network of nanowires characterized an abundance of surface area and high durability.

"With this breakthrough, the notion of hydrogen vehicles becoming commonplace has become more realistic. It allows them to become cheaper, more sustainable and more durable," says Jan Rossmeisl.

Dialogue with the automotive industry

The next step for the researchers is to scale up their results so that the technology can be implemented in hydrogen vehicles.

"We are in talks with the automotive industry about how this breakthrough can be rolled out in practice. So, things look quite promising," says Professor Matthias Arenz.

The research results have just been published in *Nature Materials*, one of the leading scientific journals for materials research. It is the first article in which every researcher at the basic research center, "Center for High Entropy Alloy Catalysis (CHEAC)", has collaborated. The center is a so-called Center of Excellence, supported by the Danish National Research Foundation.

"At the center, we develop new catalyst materials to create sustainable chemicals and fuels that help society make the chemical industry greener. That it is now possible to scale up the production of hydrogen vehicles, and in a sustainable way, is a major step forward," says center leader Jan Rossmeisl.

More information: Self-supported Pt–CoO networks combining high specific activity with high surface area for oxygen reduction, *Nature Materials* (2020). DOI: [10.1038/s41563-020-0775-8](https://doi.org/10.1038/s41563-020-0775-8) , www.nature.com/articles/s41563-020-0775-8

Journal information: *Nature Materials*
<https://phys.org/news/2020-08-fuel-cells-hydrogen-vehicles-longer.html>

New approach to soft material flow may yield way to new materials, disaster prediction

By Lois Yoksoulion

How does toothpaste stay in its tube and not ooze out when we remove the cap? What causes seemingly solid ground to suddenly break free into a landslide? Defining exactly how soft materials flow and seize has eluded researchers for years, but a new study explains this complex motion using relatively simple experiments. The ability to define—and eventually predict—soft material flow will benefit people dealing with everything from spreadable cheese to avalanches.

The study, which was performed at the University of Illinois, Urbana-Champaign, is published in the *Proceedings of the National Academy of Science*.

"We are finding that soft material flow is more of a gradual transition rather than the abrupt change the current models suggest," said chemical and biomolecular engineering professor Simon Rogers, who led the study and is an affiliate of the Beckman Institute for Advanced Science and Technology at the U. of I.

The team developed a new testing protocol that allows researchers to measure the individual solidlike and liquidlike behaviors of these materials separately—something never done before, said Gavin Donley, a graduate student and lead author of the study.

In the lab, the team subjected a variety of different soft materials—a polymer microgel, xanthan gum, a glasslike material and a filled polymer solution—to shear stress and measured the individual solidlike and liquidlike strain responses using a device called a rheometer.

"Our experiments show us a much more detailed and nuanced view of soft material flow," Donley said. "We see a continuous transition between the solid and liquid states, which tells us that the traditional models that describe an abrupt change in behavior are oversimplified. Instead, we see two distinct behaviors that reflect energy dissipation via solid and fluid mechanisms."

The team's immediate goal is to turn this experimental observation into a theoretical model that predicts soft material motion, Rogers said.

"The existing models are insufficient to describe the phenomena that we have observed," he said. "Our new experiments are more time-consuming, but they give us remarkable clarity and understanding of the process. This will allow us to push soft materials research forward in a slightly different direction than before. It could help predict the behaviors of novel materials, of course, but also help with civil engineering challenges like mudslides, dam breaks and avalanches."

More information: Gavin J. Donley et al., "Elucidating the G" overshoot in soft materials with a yield transition via a time-resolved experimental strain decomposition," *PNAS* (2020). www.pnas.org/cgi/doi/10.1073/pnas.2003869117

Journal information: *Proceedings of the National Academy of Sciences*
<https://phys.org/news/2020-08-approach-soft-material-yield-materials.html>



1A new study from engineers at the University of Illinois, Urbana-Champaign uses simple experiments to explain how a better understanding of flowing motion of soft materials will help design new materials and could help predict some natural disasters. Photo courtesy U.S. Geological Survey

Velcro method for more precise binding of drug particles

In order to deliver drug particles to the right place in the body—a field known as nanomedicine—selectivity plays an important role. After all, the drug only has to attach itself to the cells that need it. A theory from 2011 predicts that selectivity is not only based on the type of receptor, but also on the number and strength of the receptors on the cell. Researchers at Eindhoven University of Technology are now proving this experimentally. They have published their results in the journal *PNAS*.

Cells interact with each other through receptors and ligands. They fit on each other like a key in a lock; a ligand of one cell only fits on the appropriate target receptor of the other cell. The field of nanomedicine makes use of this by imitating ligands that fit the receptors of the diseased cell that needs the drug.

In 2011, Daan Frenkel and his group in Cambridge used a theoretical model to predict that not only the type of ligands and receptors play a major role, but also the number and strength. This means that even weak ligands can bind, as long as there are enough receptors present on the surface of the target cell. Researchers Max Scheepers, Leo van IJzendoorn, and Menno Prins, all part of the Institute for Complex Molecular Systems, have now proven this theory experimentally with particles for the first time.

Many weak bonds become strong

Van IJzendoorn: "Compare it to Velcro. If one hook is fastened, the strip does not stick immediately. Only when several hooks are fastened does the bond become strong enough. This is also how it works in the human body; the weak binding of a ligand on a receptor becomes enormously strong the more there are."

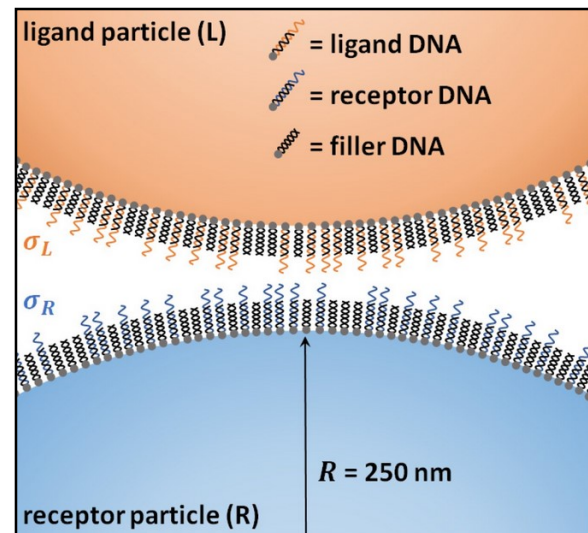
And that's a useful feature for nanomedicine. Diseased cells do not always have different receptors than healthy cells, but they often have more receptors on their cell walls. By developing the drug in such a way that it only sticks to cells with a lot of receptors, you can still distinguish between diseased and healthy cells. This makes it possible to send the drug particles more precisely to the diseased cells in the body.

Single strand DNA as receptor and ligand

"We have now experimentally demonstrated with particles that many weak ligands give a high selectivity: The particles only bind if there are exactly enough receptors present. This creates a threshold value," explains van IJzendoorn. The researchers carried out a binding experiment for this purpose, designing particles with either receptor DNA or ligand DNA on its surface.

A magnetic field first pulled the particles toward each other, and after some time, released them. Van IJzendoorn: "This allowed us to optically measure how many particles had developed a strong molecular binding with each other."

By varying the number of DNA molecules and the strength of the ligand-receptor binding, not only were the researchers able to see how many bindings were needed for the particles to stay bonded, but also to observe the emergence of the threshold value.



TU/e researchers prove selectivity based on number of receptors on the cell walls. Credit: TU Eindhoven

Nanomedicine and biosensors

Van IJzendoorn says, "These results form a new benchmark for understanding and applying selectivity in biomedical applications. The work provides a fundamental basis for the design of binding processes in nanomedicine. In addition, it is important for the development of nanotechnological biosensors, because particles are also used in these systems for the establishment of selective bonds."

This research was published on 24 August in the journal *PNAS*, titled "Multivalent weak interactions enhance selectivity of inter-particle binding." The research was carried out at Eindhoven University of Technology, at the departments of Applied Physics and Biomedical Engineering and the Institute for Complex Molecular Systems.

More information: M.R.W. Scheepers et al., Multivalent weak interactions enhance selectivity of interparticle binding, *PNAS* (2020). www.pnas.org/cgi/doi/10.1073/pnas.2003968117

Journal information: *Proceedings of the National Academy of Sciences*
<https://phys.org/news/2020-08-velcro-method-precise-drug-particles.html>



Tue, 25 Aug 2020

Re-engineered enzyme could help reverse damage from spinal cord injury and stroke

A team of researchers from University of Toronto Engineering and the University of Michigan has redesigned and enhanced a natural enzyme that shows promise in promoting the regrowth of nerve tissue following injury.

Their new version is more stable than the protein that occurs in nature, and could lead to new treatments for reversing nerve damage caused by traumatic injury or stroke.

"Stroke is the leading cause of disability in Canada and the third leading cause of death," says University of Toronto Engineering professor Molly Shoichet, senior author on a new study published in the journal *Science Advances*.

"One of the major challenges to healing after this kind of nerve injury is the formation of a glial scar."

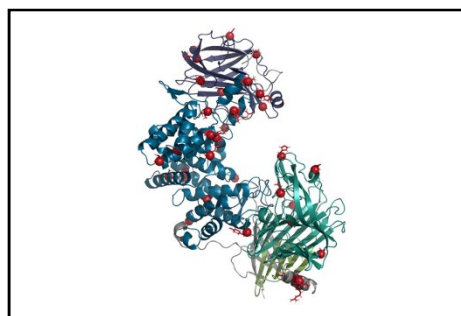
A glial scar is formed by cells and biochemicals that knit together tightly around the damaged nerve. In the short term, this protective environment shields the nerve cells from further injury, but in the long term it can inhibit nerve repair.

About two decades ago, scientists discovered that a natural enzyme known as chondroitinase ABC—produced by a bacterium called *Proteus vulgaris*—can selectively degrade some of the biomolecules that make up the glial scar.

By changing the environment around the damaged nerve, chondroitinase ABC has been shown to promote regrowth of nerve cells. In animal models, it can even lead to regaining some lost function.

But progress has been limited by the fact that chondroitinase ABC is not very stable in the places where researchers want to use it.

"It's stable enough for the environment that the bacteria live in, but inside the body it is very fragile," says Shoichet. "It aggregates, or clumps together, which causes it to lose activity. This



In this rendering of the enzyme chondroitinase ABC, point mutations are represented by red balls. This re-engineered form of the enzyme is more stable and more active than the wild type and could be used to help reverse nerve damage caused by spinal cord injury or stroke. Credit: Hettiaratchi, O'Meara et al., 2020. DOI: 10.1126/sciadv.abc6378 This work is licensed under CC BY-NC

happens faster at body temperature than at room temperature. It is also difficult to deliver chondroitinase ABC because it is susceptible to chemical degradation and shear forces typically used in formulations."

Various teams, including Shoichet's, have experimented with techniques to overcome this instability. Some have tried wrapping the enzyme in biocompatible polymers or attaching it to nanoparticles to prevent it from aggregating. Others have tried infusing it into damaged tissue slowly and gradually, in order to ensure a consistent concentration at the injury site.

But all of these approaches are mere Band Aids—they don't address the fundamental problem of instability.

In their latest paper, Shoichet and her collaborators tried a new approach: they altered the biochemical structure of the enzyme in order to create a more stable version.

"Like any protein, chondroitinase ABC is made up of building blocks called amino acids," says Shoichet. "We used computational chemistry to predict the effect of swapping out some building blocks for others, with a goal of increasing the overall stability while maintaining or improving the enzyme's activity."

"The idea was probably a little crazy, because just like in nature, a single bad mutation can wreck the structure," says Mathew O'Meara, a professor of computational medicine and bioinformatics at the University of Michigan, and co-lead author of the new paper.

"There are more than 1,000 links in the chain that forms this enzyme, and for each link you have 20 amino acids to choose from," he says. "There are too many choices to simulate them all."

To narrow down the search space, the team applied computer algorithms that mimicked the types of amino acid substitutions found in real organisms. This approach—known as consensus design—produces mutant forms of the enzyme that don't exist in nature, but are plausibly like those that do.

In the end, the team ended up with three new candidate forms of the enzyme that were then produced and tested in the lab. All three were more stable than the wild type, but only one, which had 37 amino acid substitutions out of more than 1,000 links in the chain, was both more stable and more active.

"The wild type chondroitinase ABC loses most of its activity within 24 hours, whereas our re-engineered enzyme is active for seven days," says Marian Hettiaratchi, the other co-lead author of the paper. A former postdoctoral fellow in Shoichet's lab, Hettiaratchi is now a professor of bioengineering at the University of Oregon's Phil and Penny Knight Campus for Accelerating Scientific Impact.

"This is a huge difference. Our improved enzyme is expected to even more effectively degrade the glial scar than the version commonly used by other research groups," says Hettiaratchi.

The next step will be to deploy the enzyme in the same kinds of experiments where the wild type was previously used.

"When we started this project, we were advised not to try as it would be like looking for a needle in a haystack," says Shoichet. "Having found that needle, we are investigating this form of the enzyme in our models of stroke and spinal cord injury to better understand its potential as a therapeutic, either alone or in combination with other strategies."

Shoichet points to the multidisciplinary nature of the project as a key to its success.

"We were able to take advantage of the complementary expertise of the authors to bring this project to fruition, and we were shocked and overjoyed to be so successful," she says. "It went well beyond our expectations."

More information: Marian H. Hettiaratchi et al, Reengineering biocatalysts: Computational redesign of chondroitinase ABC improves efficacy and stability, *Science Advances* (2020). [DOI: 10.1126/sciadv.abc6378](https://doi.org/10.1126/sciadv.abc6378)

Journal information: [Science Advances](https://www.science.org)
<https://phys.org/news/2020-08-re-engineered-enzyme-reverse-spinal-cord.html>

Covid-19: What you need to know today

Compared to many other viruses, Sars-CoV2 has stayed relatively stable – and that is both a good thing and a bad thing. It is good because it means vaccines currently under development have a high chance of succeeding

By R Sukumar

New Delhi: Do we know enough about the strains of the Sars-CoV2 virus in India? How many strains are there? Is there one dominant strain? Are there multiple strains?

Last week, Malaysia claimed to have discovered a strain that was “10 times more infectious” and “easily spread by a superspreader”, but as researchers around the world were quick to point out, while this strain might have been new to that country, it was the predominant strain in most parts of the world even as far back as March and April (including in Europe). Called the G clade (a biological term meaning descendants of a common ancestor), this strain is the dominant strain in India. And it is, unfortunately, a virulent one, which could perhaps explain the virus’s run through the country; India ended Monday with 3.16 million cases of Covid-19, of which 762,051 were active. It saw 58,532 deaths till Monday night.

Around the same time the Malaysian authorities made their claim – resulting in sensational headlines around the world – researchers in Singapore wrote in a study published in The Lancet that a variant of Sars-CoV2 with some of its DNA missing actually caused a milder infection than the other strain. In a small study, it was found that people in whom this strain was found did not require either oxygen support or to be put on the ventilator.

Compared to many other viruses, Sars-CoV2 has stayed relatively stable – and that is both a good thing and a bad thing. It is good because it means vaccines currently under development have a high chance of succeeding. It is a bad thing because there were hopes during the initial weeks of the pandemic that, like some viruses do, Sars-CoV2 would mutate into an unviable strain and taper off.

The ability of viruses to mutate is one reason why some experts are worried about Russia’s Sputnik-V vaccine, which hasn’t undergone the kind of rigorous tests any such vaccine should – an ineffective vaccine may, far from proving to be a cure, merely cause the virus to mutate, perhaps into something far more dangerous.

Not that Sars-CoV2 in its current form is benign. Around the world, researchers and doctors no longer see Covid-19 as a respiratory disease – it affects everything from the kidneys to the brain – and are beginning, especially as they set out to answer questions about long-Covid, to believe that it could be much more. Long-Covid refers to the sometimes debilitating and long-drawn-out fallout of Covid-19 that some patients suffer – sometimes even without being seriously ill. Those trying to find out more about long-Covid believe that one explanation for it could be that Covid-19 affects at least some patients the same way an autoimmune disorder does. An autoimmune disease is simply one where the immune system attacks the host (or an organ of the host), or one where it weakens the body’s response to infections. While this (accepting Covid-19 as an autoimmune disease) could explain some things, more research is needed before it can be classified as such.

Interestingly, one of the most promising lines of treatment for autoimmune diseases involves the use of monoclonal antibodies (called so because the antibodies are all made up of identical cells, each of which is cloned from the same parent). Several companies (Regeneron Pharmaceuticals, Eli Lilly) are testing monoclonal antibodies for Covid-19. HT’s health editor Sanchita Sharma has been writing about them from early July, from around the time Regeneron’s monoclonal antibody

REGN-COV2 entered Phase 3 trials. Scientists believe that the use of monoclonal antibodies early on in the treatment of Covid-19 could save more lives.

Another treatment for autoimmune diseases involves the use of interferons – proteins released by the body’s immune system and which provoke, regulate, or amplify the response to pathogens. And companies are experimenting with interferons, too, in the treatment of Covid-19. A study reported in July, and conducted by the University of Southampton and a company Synairgen, showed that an inhaled interferon helped Covid-19 patients recover faster.

A vaccine is necessary and important, but we’d do well to keep track of the work being done on interferons and monoclonal antibodies.

<https://www.hindustantimes.com/india-news/covid-19-what-you-need-to-know-today/story-nt3CtTuraC9oTHbj4lbwEM.html>

hindustantimes

Tue, 25 Aug 2020

Hypertension medication might help Covid-19 survival rates, study says

COVID-19 patients with high blood pressure who were taking ACEi/ARB medications were 0.67 times less likely to have a critical or fatal outcome than those not taking these medications, according to the study

New Delhi: Medication for high blood pressure may improve COVID-19 survival rates, and reduce the severity of novel coronavirus infection, particularly in patients with hypertension, according to a study.

Researchers from the University of East Anglia (UEA) in the UK studied 28,000 patients taking antihypertensives -- a class of drugs that are used to treat hypertension or high blood pressure.

The study, published in the journal Current Atherosclerosis Reports, found that the risk of severe COVID-19 illness and death was reduced for patients with high blood pressure who were taking Angiotensin-Converting Enzyme inhibitors (ACEi) or Angiotensin Receptor Blockers (ARB).

“We know that patients with cardiovascular diseases are at particular risk of severe Covid-19 infection,” said lead researcher Vassilios Vassiliou, from UEA’s Norwich Medical School.

“But at the start of the pandemic, there was concern that specific medications for high blood pressure could be linked with worse outcomes for COVID-19 patients,” Vassiliou said.

The researchers, including those from Norfolk and Norwich University Hospital, analysed what the impact of these medications is for people with COVID-19.

They studied the outcomes for patients taking antihypertensives, looking particularly at what is called ‘critical’ outcomes such as being admitted to intensive care or being put on a ventilator, and death.

The team analysed data from 19 studies related to COVID-19 and ACEi and ARB medications. The researchers noted that their meta-analysis involved more than 28,000 patients and is the largest and most detailed such study to date.

They compared data from COVID-19 patients who were taking ACEi or ARB medications with those who were not -- focusing on whether they experienced ‘critical’ events and death.



Researchers from the University of East Anglia (UEA) in the UK studied 28,000 patients taking antihypertensives -- a class of drugs that are used to treat hypertension or high blood pressure. (Representational Image) (Unsplash)

“We found that a third of COVID-19 patients with high blood pressure and a quarter of patients overall were taking an ACEi/ARBs. This is likely due to the increasing risk of infection in patients with co-morbidities such as cardiovascular diseases, hypertension and diabetes,” said Vassiliou.

“But the really important thing that we showed was that there is no evidence that these medications might increase the severity of COVID-19 or risk of death,” he said.

On the contrary, the researchers found that there was a significantly lower risk of death and critical outcomes, so they might in fact have a protective role -- particularly in patients with hypertension.

COVID-19 patients with high blood pressure who were taking ACEi/ARB medications were 0.67 times less likely to have a critical or fatal outcome than those not taking these medications, according to the study.

“Our research provides substantial evidence to recommend continued use of these medications if the patients were taking them already,” said Vassiliou.

“However, we are not able to address whether starting such tablets acutely in patients with Covid-19 might improve their prognosis, as the mechanism of action might be different,” he added. *(This story has been published from a wire agency feed without modifications to the text. Only the headline has been changed.)*

<https://www.hindustantimes.com/health/hypertension-medication-might-help-covid-19-survival-rates-study-says/story-Die9a8X66C9eopWEht2a4N.html>



Tue, 25 Aug 2020

Covishield: Phase 2 trial of Oxford COVID-19 vaccine candidate set to begin from today

By Simran Kashyap

New Delhi: The phase 2 human clinical trial of the Oxford COVID-19 vaccine candidate by Pune-based Serum Institute of India (SII) is set to begin from Tuesday.

The observer-blind, randomised controlled study to determine the safety and immunogenicity of "Covishield" on healthy Indian adults will begin at Bharati Vidyapeeth Medical College and Hospital in Pune, sources said.

Serum Institute of India has partnered with British-Swedish pharma company AstraZeneca for manufacturing the COVID-19 vaccine candidate, developed by the University of Oxford.

"We have got all approvals from the Central Drugs Standard Control Organisation (CDSCO). We are going to start the human clinical trial process at the Bharati Vidyapeeth (Deemed to be University) Medical College and Hospital from August 25. "We are sure that in line with the philosophy of our group, we are going to make available a world class COVID-19 vaccine for people of our country and make our country 'AatmaNirbhar'," Prakash Kumar Singh, Additional Director, Government and Regulatory Affairs, Serum Institute of India (SII) said.

As a rapid regulatory response, the Drugs Controller General of India (DCGI) on August 3 had given nod to the Pune Serum Institute of India (SII) for conducting phase 2 and 3 human clinical trials of the Oxford COVID-19 vaccine candidate in the country.

The trials are to be conducted across 17 selected sites, including AIIMS Delhi, B J Medical College in Pune, Rajendra Memorial Research Institute of Medical Sciences (RMRIMS) in Patna, Post Graduate Institute of Medical Education and Research in Chandigarh, AIIMS-Jodhpur, Nehru Hospital in Gorakhpur, Andhra Medical College in Visakhapatnam and JSS Academy of Higher Education and Research in Mysore, SII sources had said.

Around 1,600 people aged above 18 years are likely to participate in the trials.

To introduce the vaccine, SII, the world's largest vaccine maker by number of doses produced and sold, has signed an agreement to manufacture the potential vaccine developed by the Jenner Institute (Oxford University) in collaboration with British-Swedish pharma company AstraZeneca.

Initial results of the first two-phases of trials of the vaccine conducted in five trial sites in the UK showed it has an acceptable safety profile and homologous boosting increased antibody responses, sources had said.

<https://www.oneindia.com/india/covishield-phase-2-trial-of-oxford-covid-19-vaccine-candidate-set-to-begin-from-today-3138815.html>

THE TIMES OF INDIA

Tue, 25 Aug 2020

Italy begins testing potential Covid-19 vaccine on volunteers

Rome: Italy kicked off human trials of a potential Covid-19 vaccine on Monday, joining a global effort to develop a response to the virus which has shown signs of resurging in Europe.

Rome's Lazzaro Spallanzani institute, a hospital specializing in infectious diseases will conduct trials on 90 volunteers over the coming weeks, with the hope a vaccine may be available by spring of next year.

Francesco Vaia, health director of the Spallanzani hospital, told Reuters the first patient will be monitored for four hours before being allowed to go home where he will be kept under observation for 12 weeks.

"We will see if it produces any side effects and if it produces neutralizing antibodies," Vaia said, adding the second phase of testing will take place in countries with higher infection rates, like Mexico and Brazil.

"If we are able to be fast, we will have the first shots on the market next spring," Vaia added.

The potential vaccine, called GRAd-COV2, was developed by ReiThera, a company based in Rome. The Lazio region, around the Italian capital, said in a statement early trials, including on animals, had delivered positive results.

Potential vaccines are undergoing trials in a number of different countries including India, Britain, Russia and China, as scientists have raced to unpick the secrets of a virus that emerged less than a year ago.

"Our country's minds and research are at the service of the global challenge to defeat Covid," Health Minister Roberto Speranza wrote on Facebook announcing the start of the trial.

Italy, one of Europe's worst-hit countries with more than 35,000 deaths, saw the epidemic peak between March and April before the outbreak appeared to be on the retreat. But it has since seen a surge in new cases with more than 1,000 recorded on both Saturday and Sunday.

Other countries in Europe have seen even bigger jumps as tight restrictions and social distancing measures imposed earlier in the year have been eased. Italy begins testing potential Covid-19 vaccine on volunteers

ROME, Aug 24 (Reuters) - Italy kicked off human trials of a potential Covid-19 vaccine on Monday, joining a global effort to develop a response to the virus which has shown signs of resurging in Europe.

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<https://timesofindia.indiatimes.com/world/europe/italy-begins-testing-potential-covid-19-vaccine-on-volunteers/articleshow/77720609.cms>

STAT

Tue, 25 Aug 2020

First Covid-19 reinfection documented in Hong Kong, researchers say

By Andrew Joseph

Researchers in Hong Kong on Monday reported what appears to be the first confirmed case of Covid-19 reinfection, a 33-year-old man who was first infected by SARS-CoV-2 in late March and then, four and a half months later, seemingly contracted the virus again while traveling in Europe.

The case raises questions about the durability of immune protection from the coronavirus. But it was also met with caution by other scientists, who questioned the extent to which the case pointed to broader concerns about reinfection.

There have been scattered reports of cases of Covid-19 reinfection. Those reports, though, have been based on anecdotal evidence and largely attributed to flaws in testing.

But in this case, researchers at the University of Hong Kong sequenced the virus from the patient's two infections and found that they did not match, indicating the second infection was not tied to the first. There was a difference of 24 nucleotides — the "letters" that make up the virus' RNA — between the two infections.

"This is the world's first documentation of a patient who recovered from Covid-19 but got another episode of Covid-19 afterwards," the researchers said in a statement.

Experts cautioned that this patient's case could be an outlier among the tens of millions of cases around the world and that immune protection may generally last longer than just a few months. They said that ongoing studies tracking patients who had recovered from Covid-19 would help reach more definitive conclusions. They also noted that the man's second case was milder than his first, indicating that his immune system was providing some level of protection, even if it could not prevent the infection entirely.

“There’s been more than 24 million cases reported to date,” Maria Van Kerkhove, a coronavirus expert at the World Health Organization, said at a briefing Monday, when asked about the Hong Kong report. “And we need to look at something like this at a population level.”

The question of how long someone is protected from Covid-19 after being infected and recovering looms large.

Studies are increasingly finding that most people who recover from the illness mount a robust immune response involving both antibodies (molecules that can block the virus from infecting cells again) and T cells (which can help clear the virus). This has suggested that people would be protected from another case for some amount of time.

But based on what happens with other coronaviruses, experts knew that immunity to SARS-CoV-2 would not last forever. People generally become susceptible again to the coronaviruses that cause the common cold after a year or even less, while protection against SARS-1 and MERS appears to last for a few years.

“What we are learning about infection is that people do develop an immune response, and what is not completely clear yet is how strong that immune response is and for how long that immune response lasts,” Van Kerkhove said. She added she was still reviewing the Hong Kong case.

The strength and durability of the immune response is also a crucial factor in how long vaccines will be effective for, and for how often people might need a booster dose.

In the Hong Kong case, the man had traveled to Spain and returned to Hong Kong via the United Kingdom. A saliva sample was taken upon arrival in Hong Kong as part of a screening protocol and tested positive for SARS-CoV-2 on Aug. 15.

During his second infection, the man did not have any symptoms. Some patients go through their course of Covid-19 without showing symptoms, but researchers have also hypothesized that secondary cases of the coronavirus will generally be milder than the first. Even if immune systems can’t stop the virus from infecting cells, they might still rally some level of response that keeps us from getting sicker. During his first case, the patient had classic Covid-19 symptoms of cough, fever, sore throat, and headache.

Experts said it was also important to consider the immune response the patient generated after his first infection. While most people seem to mount a solid response, there has been indication that some people do not produce neutralizing antibodies — those that can block the virus from infecting cells — at very high levels, for unclear reasons.

“The fact that somebody may get reinfected is not surprising,” said Malik Peiris, a virologist at the University of Hong Kong, who is not an author of the paper describing the reinfection but is familiar with the case. “But the reinfection didn’t cause disease, so that’s the first point. And the second thing is that it is important to know whether the patient mounted a neutralizing antibody response to the first infection or not. Because the vast majority of patients in our experience do mount a good neutralizing antibody response. So is this person an outlier or is he likely to be the average person infected?”

Even if the Hong Kong case is an outlier, it points to a few implications: For one, people who have recovered from Covid-19 should also be vaccinated, the researchers said. And they should continue following precautions like wearing a mask and physical distancing.

Helen Branswell contributed reporting.

<https://www.statnews.com/2020/08/24/first-covid-19-reinfection-documented-in-hong-kong-researchers-say/>

