GOVERNMENT OF INDIA MINISTRY OF SCIENCE AND TECHNOLOGY DEPARTMENT OF BIOTECHNOLOGY

LOK SABHA UNSTARRED QUESTION No. 2190 TO BE ANSWERED ON 23.09.2020

Covid-19 Pandemic

2190. Shri Uttam Kumar Reddy Nalamada:

Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

- a) The details of Government approved technology driven solutions and interventions to address the COVID-19 pandemic;
- b) The funds allocated for research of technology to address the pandemic;
- c) The details of plans to roll out these solutions to the public in order to protect people from the virus till a more permanent solution is found; and
- d) Whether any of these solutions have been implemented in Government offices and if so, the details thereof and if not, the reasons therefor?

ANSWER

MINISTER OF HEALTH & FAMILY WELFARE; MINISTER OF SCIENCE AND TECHNOLOGY; AND MINISTER OF EARTH SCIENCES

(DR. HARSH VARDHAN)

(a) & (b)

During the current COVID-19 crisis, Government of India is working towards development of innovative technological interventions in terms of devices, diagnostics, vaccines, therapeutics & other related interventions through its various concerned Ministries and Departments. In past few months, major focus has been put forth on fostering R&D support to industries and academia towards development of diagnostic kits, therapeutics, vaccines and other interventions like efficient sanitization methods, facial mask, Contactless Digital Sanitation etc. The budget allocated to different schemes for R&D is Rs.379.53 Crore. The details of these activities are given in **Annexure-A**.

- (c) The technological interventions supported through various Ministries and their Departments in terms of diagnostics, therapeutics, PPEs, masks, sanitizers etc. are being used across the country in order to protect people from this COVID virus.
- (d) The various PPE, Masks and Diagnostic kits have been deployed across the country including the Government offices.

Annexure -A

A. Department of Biotechnology (DBT):

The Department of Biotechnology (DBT) and its public sector undertaking Biotechnology Industry Research Assistance Council (BIRAC) have collaborated across the healthcare innovation ecosystem ranging from biotech companies to entrepreneurs coming up with innovations to academic institutions to address the COVID-19 global health care crisis. A call on COVID-19 Research Consortium was announced to support R&D proposals on devices, diagnostics, therapeutics, vaccine candidates and other interventions.

- Devices & Diagnostics: The Department has supported Infectious disease lab (I-Lab), which is a mobile lab for COVID-19 testing under the National Biopharma Mission to the Andhra Pradesh Med Tech Zone (AMTZ), Vishakapatnam in order to further enable testing access to rural India. The I-lab was launched by Hon'ble Minister S&T, MoHFW & MoES on 18thJun 2020. This can perform both RT-PCR and ELISA tests. The first lab is attached to THSTI hub and had performed about 5000 tests in the Faridabad region. The Department is supporting17 proposals in the area of Diagnostics with a total cost of 1000.93 lakhs.
- 2. **Therapeutics:** Considering the present COVID crisis, the Department is supporting 13 proposals in the area of Therapeutics with a total cost of Rs. 964.035 Lakhs. Of these, some of the targeted leads are very much promising.
- 3. Vaccine: Recognizing the critical requirement for a safe and efficacious vaccine for COVID-19, in effective control of the pandemic, the Government of India, is supporting vaccine development activities. Currently, nearly 30 vaccine candidates for COVID-19, based on multiple technologies / platforms are under development in India, by both academia and industry. Of these, the Department of Biotechnology is supporting 8 proposals by industry and 2 by academia for candidate vaccine development and associated research resources. A total cost of INR 75 crore has been allocated for supporting vaccine development efforts. Availability of vaccine is subject to successful completion of Phase III clinical trials.
- 4. **Other interventions:** In the area of Other Interventions, the Department is supporting 5 proposals with a total cost of Rs. 86.88 Lakhs.
- 5. Herbal Formulations: The Department is implementing3 Sub-Networks under "DBT-AYUSH Network Programme on R&D Activities related to SARS-CoV-2 Virus and COVID-19 Disease" at a total cost of ₹ 595.44 lakhs to be shared equally by DBT and National Medicinal Plants Board (NMPB), Ministry of AYUSH with an aim to screen selected traditional knowledge-based medicinal plants and classical formulations for anti-SARS-CoV-2 activities in cell culture models of virus infection. Studies are also planned to be carried out on preclinical and pharmacokinetics evaluation of selected AYUSH herbal extracts / formulations for mitigating SARS-CoV2 and associated pathologies.

The Department in collaboration with Biotechnology Industry Research Assistance Council (BIRAC) announced a Joint call on "Anti- SARS-CoV-2 /nCoV-2 Virus Studies using Botanical Ingredients and Traditional Formulations". Under this call, total 229 proposals were received for further processing.

6. **COVID-19 Bio-bank:** As per the directives of Cabinet Secretary of National COVID-19 Biorepositories and recent ICMR notification, the Department is also supporting COVID-19 Biorepositories at following centers with a total cost of Rs. 1099.00 Lakhs:

S.N	Institute
1.	 NCR-Biotech Science Cluster, a. Translational Health Science and Technology Institute (THSTI), Faridabad and b. Regional Centre for Biotechnology (RCB), Faridabad
2.	Institute for Stem Cell Science and Regenerative Medicine (inStem), Bangalore
3.	Institute of Life Sciences (ILS), Bhubaneswar
4.	National Centre for Cell Science (NCCS), Pune
5.	Institute of Liver and Biliary Sciences (ILBS), New Delhi (DBT-supported Bio- repository)

7. Under **National Biopharma Mission**, the Department is supporting technology driven solutions and interventions to address COVID-19 pandemic broadly in the area of vaccines, devices and diagnostics and therapeutics with a total investment of Rs. 222.crores. The details of technologies under support are as follows:

Segment	Technologies Supported
Vaccines	Vaccine - Development of recombinant vector vaccine
	Vaccine - Phase III trial of rBCG vaccine
	Vaccine - DNA vaccine
	Vaccine - Development of Rabies vector based vaccine
	Production of spike protein and receptor binding domain protein of SARS CoV-2 for Diagnostic use
	Vaccine evaluation animal model platform
Diagnostics (n= 8 Diagnostic kits and	Diagnostic Technology (RT PCR test)
2 manufacturing Facilities	Diagnostic Technology - (Colorimetric test)
	Diagnostic Technology (Lateral Flow assay based antigen detection test kit)
	Diagnostic Technology (ELISA kit)
	Diagnostic Technology (Swab testing)
	Diagnostic Technology (Rapid point of care detection kit)

	Diagnostic Technology (Scale up of virus detection kits)
	Diagnostic Technology (Lateral flow platform for viral antigen detection)
	Medi Tech Facility for manufacturing reagents and raw materials for diagnostic kits
	Medi Tech Facility - Manufacturing facility for kits, ventilators and probes
Therapeutics (n = 2)	Antibody development from convalescent patient blood and equine sources
	Antibody development from convalescent patient blood

8 Biotechnology Industry Research AssistanceCouncil(BIRAC) support:

- a. Under the BIRAC's **Fast tracked Review and Funding support under COVID-19 fund.** 5 Start-ups have been approved.
- b. **BIRAC Research Consortium:** BIRAC is supporting technology driven solutions and interventions to address COVID-19 pandemic broadly within the area of vaccines, diagnostics and devices, therapeutics, Drugs and any other interventions. Under the **BIRAC Research Consortium Budget**, a total investment of Rs. 10crores has been committed for COVID-19.
- **B.** Council of Scientific & Industrial Research (CSIR) is supporting various activities in this area. UnderNew Millennium Indian Technology Leadership Initiative (NMITLI) Scheme, six projects are being implemented at Rs. 965.600 lakh. Under a special Call, 36 projects are being implemented at Rs. 2541.54 lakh. The following activities are being supported through CSIR:

a. Diagnostics:

FELUDA: CSIR-IGIB has developed indigenous novel Covid-19 diagnostic kit called FELUDA (FNCAS9 Editor-Linked Uniform Detection Assay), a CRISPR-Cas9 based test licensed to TATA Sons. FELUDA has been approved by the Drug Controller General of India (DCGI). This is the only third CRISPR based technology in the world to obtain regulatory approval for the detection of Coronavirus. The other methods using Cas12 and Cas13 proteins were developed by scientists at the University of California, Berkeley (UCB) and MIT in the USA. This method uses the FnCAS9 enzyme which was characterized and adapted for Covid19 detection at CSIR-IGIB. The detection relies on a simple visual readout using paper-based detection chemistry. It is rapid, sensitive and specific. The entire method takes up to an hour, does not need high-end instrumentation and can aid in scaling up the testing quickly in the country.

b. Drug Development:

• **Favipiravir:** CSIR-IICT has developed and patented the synthesis of Favipiravir. It has transferred the process to Cipla for manufacturing. Cipla has brought the drug to the market. Further, CSIR transferred the process to another 5 companies on non-exclusive basis. This product is approved by DCGI as drug for mild and moderate patients of Covid-19

• **Remdesivir:** CSIR-IICT has developed process technology and handed over to companies that have got a license from Gilead. CSIR technology has resulted in providing this drug at an affordable price to patients.

c. Personal Protective Equipment (PPE):

- **Coverall:** CSIR-NAL has developed high quality PPEs and transferred the technology to MAFL, Bengaluru. It has gone through stringent testing at South India Textile Research Association (SITRA), Coimbatore and has been certified to ASTM F1670/F1670M-08(2014) for use. After certification, about one lakh pieces have been supplied to Government. The current capacity of the production is 7000/day which can be enhanced to 30,000/day depending upon requirement.
- Face Mask: CSIR constituents laboratories have developed following face masks:
 - i) **High Efficiency Hydrophobic Three-Layered Facemask:** The facemask is composed of two/three hydrophobic non-woven polypropylene (PP) layers in the outer and inner side and a 'High Efficiency Particulate Air' filter in the middle. The performance of the developed mask certified from SITRA, Coimbatore.
 - ii) **Poly Ti:A Biopolymer Coated Medical Grade Mask:** It is a two layered masks that use biopolymer (Bacterial cellulose) coated mask, which are having much higher surface area and very fine nanofiber of cellulose to trap viruses and bacteria. It is developed using the patented technology of CSIR-NCL on Bacterial cellulose. The performance of the developed mask certified from SITRA, Coimbatore.
 - iii) **Reusable Face Mask with Antimicrobial Coating:** It is a tri-layered mask which consists of the hydrophobic outer layer that repels the liquid aerosol and the middle bactericidal layer to kill the microbes that comes in contact with the masks thereby providing dual protection benefits to the end-users. The inner hydrophilic layer absorbs the hot air, sweat and facilitates improved breathability. These masks and the coatings have been designed and formulated to sustain up to 30-50 washes. The properties of the masks have been certified by SITRA, Coimbatore.
- **C. AYUSH:** Ayush Sanjivani mobile app developed by Ministry of AYUSH has been launched to generate data on acceptance and usage of AYUSH advocacies and measures among the population and its impact in prevention of COVID-19 targeting 05 million populations. This mobile app is also having advisories related to need for self-care measures for immunity boosting and various Ayurvedic immunity promoting measures during COVID-19 crisis.
- **D.** Indian Council of Medical Research (ICMR): has validated 866 diagnostic commodities for COVID-19. Out of this, 443 have been approved. Additionally, alternate indigenous testing platforms like TrueNat and CBNAAT have also been validated and approved for use. These platforms have improved access to testing at district and primary health center level. Also, newer Rapid Antigen Tests have been validated and approved for use. This has increased access to testing at field level. Indigenization of technologies for COVID-19 testing as well as handholding of indigenous manufacturers has tremendously helped in upscaling testing in India.

E. Department of Science and Technology (DST):

DST has announced a call on COVID -19 under Technology Development Board (TDB) and approved proposals and financial support for diagnostics development.