

DG's Meeting with Directors and HoDs of CSIR through Zoom

March 28, 2020

Minutes of the Meeting

A meeting of DG, CSIR with Directors of CSIR Labs was organized through Zoom on March 28, 2020 to discuss CSIR efforts to tackle the menace of Coronavirus. The summary of important points which emerged during the meeting is as follows:

1. Promotion of Rural Entrepreneurship relating to Covid-19 through CSIR Interventions

Shri AK Kundalia, Sr. Pr. Scientist, CSIR-RPPBDD made a detailed presentation **(Attached)** on progress on Promotion of Rural Entrepreneurship relating to Covid-19 through CSIR Interventions. The following emerged from the discussion:

a. Action Points for Labs

- Each CSIR lab to endeavour to identify and develop/take care of entrepreneurs from 10 nearby villages or may be possibly 100 even better through technology, training and trade.
- Social distancing aspect to be taken care of while training entrepreneurs (More of Digital);
- Low hanging deliverables can be given by next week (e.g. Disinfectants, Sanitizers, Soaps, Masks, Gloves, Food Products, Water Purification kits etc. can be provided through social and voluntary organizations);
- Specialized deliverables like ventilators, rapid housing and quarantine hospitals/structures, walk through disinfectant structures etc. can be delivered through appropriate MSMEs);
- CSIR labs can also approach industries for tapping CSR money exclusively for COVID-19 control endeavours;
- CSIR labs to explore finding possible Ideas/solutions utilizing plants/materials for reducing the viral load in ambient environment; and
- CSIR labs are requested to submit proposals on this aspect to RPPBDD by April 5, 2020. RPPBDD to provide a simple format for submission of proposal to the CSIR laboratories

b. Action Points for CSIR HQs

- Based on lab proposals, processing for funding to each lab in just few days' time, by taking FA, CSIR on board (If required by utilizing special powers of DG, CSIR)
- Coordination and Monitoring by RPPBDD under leadership of DG, CSIR

Action: CSIR labs

Lead Advisor: Dr Sudeep Kumar

Headquarters co-ordination: Shri Arvind Kundalia

2. CSIR's S&T Interventions and Collaboration with industry/stakeholders to control coronavirus:

A detailed discussion was held on CSIR's S&T Interventions and modalities of collaboration with industry/stakeholders to control coronavirus. It was decided that:

- a. **Dr. Ram A. Vishwakarma**, Director, CSIR-IIIM will do the **Overall Coordination** of various CSIR initiative on the matter relating to COVID-19; and
- b. **Shri R.P.Singh, In-charge, Mission Directorate will provide headquarter interface to the overall coordination of the Coronavirus related activities and work closely with Dr. Ram Vishwakarma;**
- c. **Dr. Vibha Malhotra Sawhney**, In-charge, CSIR-IPU will be the **Nodal** from CSIR Hqs for liaising and co-ordination with line ministries/departments and high level authorities viz. Ministry of Health, Health Secretary, ICMR, Niti Aayog, PSA office etc.
- d. A platform for open innovation will be developed and hosted at CSIR Hq. **Dr. Geeta Vani Rayasam** will coordinate the effort.
- e. Collaboration with industries like Intel, TCS, Reliance, HUL, BHEL to be taken forward rapidly to deliver. **(Action: All concerned)**
- f. Approach the State/District Authorities and Hospital authorities to ascertain their constrains / requirements and take steps as required. **(Action: All Labs)**
- g. Discussion in small group as indicated in later part of the minutes should happen frequently whereas common discussion like this can happen once in a week. **(Action: All concerned)**

The points emerged from the discussion on **5 verticals** are as follows:

i. **Digital and Molecular Surveillance**

Dr. Anurag Agrawal informed about the various steps being taken up under the digital surveillance vertical of COVID 19 Outbreak strategy. This underlines the use of digital technologies such as big data and AI linked to detection of cases so that it would enable quick detection of cases and isolation leading to decrease in the load on health infrastructure. He informed that CSIR is working with industry partners like INTEL, TCS among others. CSIR-IGIB may lead digital surveillance of coronavirus spread in association with Intel and TCS and also take other CSIR labs on board.

As the number of coronavirus infected people in the country will increase with the time, it is likely that coronavirus will mutate. Therefore, it is imperative for CSIR labs (CSIR-CCMB, CSIR-IGIB etc.) to do molecular surveillance to know that how virus is mutating and what strategy could be adopted to control the spread and

infectivity. CSIR-CCMB may lead the molecular surveillance activity from CSIR in collaboration with other biological labs.

Action: CSIR-IGIB; CSIR-CCMB

Lead Director: Dr Anurag Agarwal

Headquarters co-ordination: Dr Geetha Vani

ii. Rapid and Economical Diagnosis

- CSIR will work on RT-PCR based, RNA sequence based, Crispr/cas based paper diagnostic and sero diagnosis. It was felt that sero diagnosis will help at later stage when patients come out after coronavirus illness. Even some countries are taking out serum from recovered persons and giving to diseased persons to boost their immunity against coronavirus.
- It is felt that country will face shortage of essential chemicals related to RT-PCR such as primers, nucleotides and other critical reagents. CSIR labs should gear up to meet this demand. CSIR-IICT is already making Reverse Transcriptase in large quantities and can lead CSIR efforts with other labs having fermentation facilities. It was suggested to tie up with companies such as Reliance, produce it on large scale and supply. Reliance has set a target of Rs 90 per test. It was felt during the discussion that with indigenous chemicals, it is possible to meet the target.
- CSIR should request ICMR to recognize leading CSIR labs as validation and certification labs for molecular diagnostics. Dr Rakesh Misra will draft a letter for DG, CSIR to be addressed to DG, ICMR for the same. Dr Vibha Malhotra Sawhney will co-ordinate this activity.
- CSIR-CCMB is working on developing Vero Cell line to culture coronavirus. It will complete the development within a week. It will share the cell line with other CSIR labs.
- Development of new test by Abott laboratories which is available only in USA was also discussed. It was felt that CSIR should come up with similar test.
- Each CSIR lab should identify around 10-100 affected nearby villages and ensure the supply of materials such as hand sanitizers, disinfectants, soaps, masks and gloves.
- Technology for Isopropanol/alcohol based Herbal formulation for sanitizer is available with CSIR-IHBT, CSIR-NBRI and CSIR-NEIST. The labs to come together and make strategy to rope in stakeholder industries/local industry to produce them in mass and make available to nearby PHCs and villages Health centres.
- Put the SOPs and recipes for developed serological/molecular based diagnostic test on open source web platform that is being installed at CSIR Hq through collaborative efforts of TCS and Microsoft (next week) and/or through Venture centre as suggested by Dr Premnath to enable entrepreneurs' access, for manufacturing to meet the demand.

Action: CSIR-CCMB; CSIR-IGIB; CSIR-IICB; CSIR-IMT; CSIR-IICT and others

Lead Director: Dr Rakesh Misra

Headquarters co-ordination: Dr Vandna Bisht

iii. Development of new therapies, including repurposing of drugs and new drugs

- Dr. Chandrasekhar informed that there is acute shortage of Viral Transport medium in some hospitals. It was informed that **Saline Buffer** can be used as viral transport medium which is WHO approved.
- There is a surge in in-vivo and in-vitro analysis of all the existing drugs. The drugs like Remdesivir, hydroxychloroquine, Azithromycin, Favipiravir, Lopinavir, Ritonavir etc. are helpful for coronavirus treatment. Favipiravir in combination with Chloroquine/Hydroxi- Chloroquine are showing good result in treatment of coronavirus affected patients. Lopinavir and Ritonavir are also showing good results. Fortunately, these are produced in India. The Country should not export APIs of these drugs to other countries.
- Finally, it looks like Remdesivir is going to take over the most treatment. Gilead Sciences, Inc., USA has been developing an experimental drug called Remdesivir, and it's viewed as one of the more promising treatments for people with COVID-19. The US-FDA has just given it orphan drug status. That gives Gilead a seven-year exclusivity period to sell the drug. Thus, Govt. of India has to push very hard to Gilead and see that they give compulsory licensing to Indian Manufacturers as early as possible at the top level. Indian Govt. should take up the matter with US Govt. / US-FDA for compulsory licensing. At least Govt. controlled manufacture should be allowed for very critical patients. It was observed that we don't need technology/process but the permission for manufacturing. It was suggested that a draft of letter to be written by DG, CSIR to Vice Chairman and Member Health of Niti Aayog and PSA be sent by D/IICT immediately.
- It was requested to D/IGIB to see if he can get some data from clinician on combination of Favipiravir and chloroquine / hydroxychloroquine which would be very useful. The hydroxychloroquine has been approved by DCGI as prophylaxis use among medical professionals engaged in COVID-19. CSIR is coming up with process for Favipiravir. However, the KSM is the major bottleneck for which ISTAD has taken the matter with Chinese ambassador through MEA. It was suggested that ISTAD should also take the matter with Japanese ambassador.
- China has recently approved drug Arbidol for the treatment of COVID-19. It is out of patent. However, there are no suppliers of its KSM/API in India. Thus, CSIR-NCL and CSIR-CDRI should take it up for process development of Arbidol with industries.
- It was informed that CSIR-IICT has been able to develop Reverse Transcriptase (RT) which is found to be working fine for tests. CSIR-IICT can make the RT available for about 5 lakh experiments.
- There are over 70 odd drugs in various stages of clinical trials. CSIR-CDRI should look into the clinical/integrity data of those drugs. Anything in advance phase 2 and beyond could be promising.
- It was suggested that CSIR with Pharma companies should also look into the possibility of clinical trials for repurposing of drugs / vaccine development as India has also got large number of patients. It was suggested that we should go ahead with two things (i) MW trials of Cadila as it has got some promise; and (ii) recovered Patient's sera to see if can get into the vaccine trials soon.

CSIR would be very happy to support it if any pharma company comes forward for these translational works.

- WHO recommended 6 molecules to be looked by chemical labs. Dr. Vishwakarma will be sharing the list.

Action: CSIR-IICT; CSIR-CDRI; CSIR-NCL; CSIR-NIIST; CSIR-IIIM

Lead Director: Dr. S Chandrashekhar

Headquarters co-ordination: Dr SK Tiwari

iv. Hospital assistive devices

a. Ventilators, Oxygenators and Oxygen Concentrators:

- CSIR-CMERI and CSIR-CSIO were advised to provide complete design and engineering of ventilators to BHEL by forenoon of March 30, 2020. Both these labs can also provide these designs to OFB.
- Both the above labs will provide a bill of materials, components and present source to Dr. Anjan Ray and BHEL. Dr. Ray will work out the supply chain to ensure the production at a mass scale.
- Both the above labs were advised to engage a certification agency that is well versed with testing and certification of medical devices, from the beginning so that developed devices do not face any regulatory issues in future.
- CSIR-NAL will work out the concept and design of the BiPAP ventilators by March 30, 2020.
- D/CMERI said that CSIR-CMERI can take up the design & development work of Oxygen Concentrator which may be required in huge quantities for providing Oxygen to mild & medium level patients.
- For the purpose, D/CMERI sought support of other CSIR laboratories to develop/ provide zeolite materials required for oxygen concentration process of the device.
- CSIR-CMERI was advised to check the availability of Oxygen Concentrators with leading developers like M/s Philips etc. before deciding for taking up design & development work of Oxygen Concentrators.
- CSIR-CMERI was also advised to take up the fabrication and validation of disinfection chamber.

Action: CSIR-CMERI; CSIR-CSIO

Lead Director: Dr Harish Hirani

Headquarters co-ordination: Shri Mayank Mathur

b. Electrostatic Sprayers

The Electrostatic Disinfection Machine, based on the electrostatic principles, produces a uniform and fine spray droplets of disinfection material in the size range of 10-20 µm. Due to the small size of droplets, the surface area of spray droplets increases which enhances the interaction with the harmful microorganisms and kill them instantaneously. Charged droplets cover the directly exposed and obscured surfaces uniformly with increased efficiency and efficacy. The machine uses significantly less disinfection material compared to conventional methods, which helps to save natural resources and reduces the chemical load on the environment.

The design was discussed in-depth and following action points emerged:

- CSIR-CSIO has provided complete design and engineering details of electrostatic sprayers to BHEL.
- CSIR-CSIO will provide a bill of materials, components and present source for making electrostatic sprayers to BHEL and Dr. Anjan Ray. Dr. Anjan Ray will work out the supply chain to ensure the production at a mass scale. In parallel, BHEL will also utilize its contact to ensure the availability of material and components

Action: CSIR-CSIO

Lead Director: Dr Sanjay Kumar

Headquarters co-ordination: Dr Hari Om Yadav

c. Personal Protective Equipment (PPE)

Of the 10 items listed under PPE, 3 items (Mask, Gown and Gloves) are expected to see significant increase in demand by the medical fraternity. It will be worthwhile if CSIR can focus on these items. In this context, CSIR Labs including CSIR-NCL, CSIR-NAL, CSIR-IICT, CSIR-CDRI may form an internal group and focus on production of self-disinfecting or reusable protective gears in consultation with Dr Anurag Agrawal.

Action: CSIR labs

Lead Director: Dr Anjan Ray

Headquarters co-ordination: Dr R M Mohanty

v. Supply chain and logistics

Dr Anjan Ray, Director, CSIR-IIP coordinating the CSIR efforts on supply chain management informed the difficulties in prevailing situation with regard to availability of materials and resources. Internal resources of CSIR can be put to use along with those offered by Industry. He desired to have list of Bill of Materials from CSIR to develop model for supply chain management with the

help of industry. Dr Ram Vishwakarma, Director, CSIR-IIIM and overall coordinator of CSIR efforts on Corona pandemic will be having discussions with TCS and other industries which can be utilized for ensuring supply chain.

Action: CSIR labs

Lead Director: Dr Anjan Ray

Headquarters co-ordination: Shri Abhishek Kumar
