Plasma-based green disinfectant

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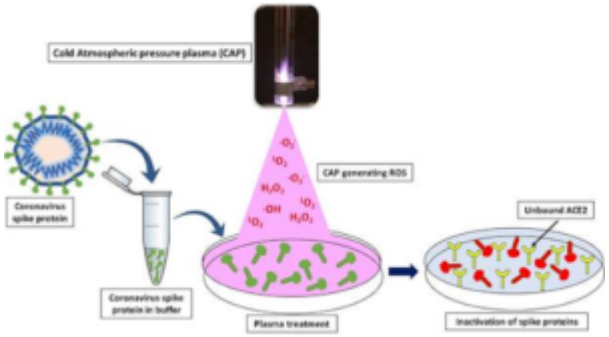
In news– Recently, the researchers have developed a plasma-based disinfectant generated with the help of cold atmospheric pressure plasma (CAP) which could act as a green decontaminant for COVID 19.

About the disinfectant-

- A team of **scientists from the Life Sciences and Physical Sciences divisions from the Institute of the Advanced Study in Science and Technology (IASST)** has demonstrated that the plasma generated by cold atmospheric pressure (CAP) has the potential to deactivate SARS-CoV-2 spike protein, which binds to human ACE2 receptor for inducing viral infection and subsequent Covid-19.
- **Plasma, the fourth state of matter which makes up most of the universe** when produced in controlled conditions in the lab and is **termed as Cold Atmospheric Pressure Plasma (CAP).**
- **The scientists passed plasma forming gases such as Helium, Argon, and Air through a high voltage electric field** which led to the formation of a stable plasma with a mixture of ions, and electrons emitting a pink glow of CAP inside the reaction chamber.
- **This research showed that short-lived highly reactive oxygen and nitrogen species (ROS/RNS) generated in the plasma led to complete deactivation of the SARS-CoV-2 Spike protein** occurring within 2 min of CAP treatment.
- The RT-PCR analysis has also established that CAP can deactivate the RNA of the SARS-CoV-2 virus.
- **The researchers showed that the CAP, a plasma-based**

disinfection method, is a better alternative to environmentally hazardous chemical-based decontamination methods.

- The cold atmospheric plasma is environmentally safe since, during the entire decontamination process by plasma treatment, no chemical waste is produced.
- As per the researchers, the disinfection method could further be extended for various bacterial or fungal infections.



Institute of the Advanced Study in Science and Technology (IASST)-

- It is an autonomous research Institute of the Department of Science and Technology (DST), Govt. of India, Guwahati, Assam.
- IASST was conceived and nurtured by the Assam Science Society in its initial years and was inaugurated by Noble Laureate Dorothy C. Hodgkin on 3rd November 1979.
- Subsequently, it was supported by the state govt. as its only autonomous R&D institute till March 2009.
- **The institute was taken over in March 2009 by the Ministry of Science and Technology, Govt of India as one of its autonomous R&D Institutes.**

The Institute is engaged in multidisciplinary research activities, both in fundamental and applied, across frontier areas of science and technology such as Plasma Physics, Polymer Sciences, Biochemistry, Drug Design & Development,

Nano-science, Medicinal Plants, Seri Biotechnology, Microbial Biotechnology, Environmental Sciences, Microbial Fuel Cell, etc.