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# Nanotechnology for Trapping Virus in the Environment

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## Opinion:

Several queries are persisting at present that have concerns about environmental and climate possessions and changes on the transmission and spread of coronavirus.[1] So many reasons have been concerned with climate and environmental conditions, which indirectly and directly improve our health, are reducing the risks of infectious disease emerged from this status quo. Another question comes into existence, such as "does air pollution has any concern with the spread of coronavirus, and viral infection.[2] It was testified that poor air quality has connected with it. Acquired outcomes ascertained that those who are living in such areas, where the poor quality of air existed, and greater probabilities are there to get affected by a viral infection in the aforementioned environments and any respiratory infections may transpire. These facts and findings have been evidenced from reported research in the literature on air pollution and virus transmission and spread. In these revisions, it was conveyed that low air quality increases the rate of transmission of infections and it increases the probabilities to get infected from influenza-like illnesses, SARS-CoV-2. Nanotechnologies are applied as key strategy for destroying SARS-CoV-2 in the environment, and overall, it effective in killing these viruses. Recently, several nanoparticles are spotted as antiviral drugs.[3] These newly designed nanoparticles displayed a crucial role to kill harmful viruses and displayed their potential. Nanoparticles destroy the virus by mimic a cell surface protein called heparin sulfate proteoglycan. Nanoparticles hold the virus tightly at the nanoscale and later on, it kills it. Advanced computational modeling, a technique that can be designed specified nanoparticles for specific whereabouts to the target SARS-CoV-2.[4] Investigations have been done to have insights into the role of antiviral nanomaterials in controlling the aerosol transmission of viruses. Several efforts have been made to develop these materials for one year that will have claims as specified previously. The author summarizes various methods applied for the preparation of antiviral nanomaterials, designing structural features, and develop in-built specific chemical properties to incapacitate and kill SARS-CoV-2.[5] These antiviral materials are acclaimed to explore the interrelated mechanisms underlying and viral destruction in the environment. In the 1880s, it was reported that nanotechnology is significantly effective against these viruses and nanomedicine can be used to destroy flu, Zika, and HIV. Nowadays, nanotechnology and nanomaterials are utilized in the fight against the SARS-CoV-2 virus and SARS-CoV-2. Nanotechnology enhanced the manufacturing of engineered nanoparticles to harness the approach to fight against numerous pathogens and viruses.[6] It is a well-known fact that engineered nanoparticles have dimensions smaller than 100 micrometers and very effective. These engineered nanoparticles easily incorporated into drugs and engineered nanoparticles enabled vaccines and drugs can be effective for targeting and killing enveloped viruses such as HIV, herpes, and influenza.[7] Certainly, these nanotools have the potential to deactivate SARS-CoV-2 in the environment.

A large variety of tools and techniques are applied by researchers, and medical doctors to destroy the COVID-19 and coronavirus in the air.[8] Nanoscience and nanotechnology approach proved its worth in the field of medicine in numerous scientific innovations and can be applied for detection, sanitation, in the development of therapies, and vaccines.6 The functional core-shell nanoparticle is very effective against SARS-CoV-2 and remains effective in various environmental conditions.[9] These findings are exceedingly appropriate as similar to well-ordered disinfection schemes. These nanotechnological methodologies ascertained their worth for testing novel and diagnosis counter to coronavirus straightaway. Therefore,

nanotherapeutics, a more scientific strategy to be used in the antiviral drug designing for innovating new nanoarchitecture remedies to destroy coronaviruses.[10] That's is why nanotechnology can easily deal with the continued challenges in SARS-CoV-2 disease management, diagnosis, and interpretation of genetic transformation.[11] Due to the nanoscale dimensions (60 to 120 nanometers), these nanoparticles are very effective in knockout SARS-CoV-2. These nanoparticles attack the virus' structure, a double-layered membrane that covers the virus and inhibits the ability to replicate and inherent their physical property theoretically. These nanoparticles are very effective in the process of destroying SARS-CoV-2 and in the fight against many viral infections.[12] Light-based technologies (nanotweezers and trappers) are widely available in the market, which can inactivate SARS-CoV-2 in air, liquids, and surfaces.[13] Phototherapy can significantly control virus infection, modulate the host immune system and mitigate the impacts of the SARS-CoV-2 pandemic. This perspective article identifies the benefits, challenges, and pitfalls of repurposing nanotechnology strategies to contest the emergence of SARS-CoV-2 pandemic.

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## Availability of data and materials:

Wherever necessary, relevant citations are included in the reference section.

## Competing interests:

The author has declared that no competing interest exists.

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