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Nanoparticles and its Use as Antiviral Drugs Transfer

Rebecca Wilson*

Editorial Office, Organic Chemistry: An Indian Journal

***Corresponding author:** Rebecca Wilson, Editorial office, Organic chemistry An Indian Journal, Email-wislson_rb@hotmail.com

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Introduction

The 1918 Spanish Influenza Pandemic ravaged the world just over 100 years ago. The flu was caused by a bacterial strain of the H1N1 influenza virus. The virus infected about a third of the world's population, killing between 50 million and 100 million people. The outbreak prompted scientists to research antiviral treatments and vaccines to combat the virus. The first inactivated influenza vaccine for civilians would not be made available in the United States until 1945. Several other influenza pandemics, including those in 1957 (H2N2), 1968 (H3N2), and 2009 (H3N2), also occurred despite the vaccine (H1N1pdm). The genetic code of the original 1918 H1N1 virus was used in all three outbreaks. These additional strains highlight the risks of viruses and the challenge of antiviral therapy.

For the last century, the influenza virus isn't the only one that has posed a serious threat to human health. The HIV outbreak started in the early 1980s, but it wasn't until millions of people were infected in 1996 that antiretroviral therapy became the standard of care. For certain people, HIV/AIDS is already a death sentence. Carriers' complex antiviral drug cocktails just delay and prolong the method. Virus outbreaks such as HPV, HCV, HBV, Dengue, and Ebola, in addition to HIV, have also had negative implications for global health. In less economically stable countries, death rates and spread are much higher.

The coronavirus has currently impacted life on six of the seven continents. Economies have collapsed, and resources have become scarce. COVID-19 has infected 50 million people and killed nearly 2.35 million people around the world. The clock on science is ticking. Viruses, it is clear, are here to stay. As long as there are human or animal hosts whose cells they can use to reproduce, they can continue to pose a threat to global public health. The world's attention must be drawn to any possible antiviral treatment choice for the sake of humanity.

The drug delivery mechanism, especially Nano particulate-based delivery systems, is one aspect of antivirals that are being studied with great interest. Many pharmaceutical companies are currently experimenting with changing their existing antiviral drug mechanisms to be Nano scale or distributed through Nano scaled vehicles. Such experiments have yielded promising results, with antiviral delivery through nanoparticles being thought to be more efficient than conventional mechanisms, and the advantages of this method will be discussed extensively in this paper. It's also worth noting that these nanoparticles are smaller copies of standard drug delivery capsules like liposomes, emulsions, and polymers, rather than

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completely new molecules. As a result, research should concentrate on nanoparticles as antiviral drug delivery mechanisms to more efficiently address global issues related to viruses.

Several prevalent forms of nanoparticles have shown great promise for antiviral drug delivery. This includes carbon-based and cyclodextrin-based nanoparticles, as well as cell structure mimics including micelles and exosomes; lipid and polymer-based nanoparticles, such as liposomes, solid lipid nanoparticles, polypeptides, and dendrimers; Nano scaled structures, such as Nano emulsions, Nano gels, and Nano crystals; metal-based Nano particles, such as metal-organic frameworks; Nano vaccines; and future Nano systems, such as Nano robots. Even though this is a lengthy list of materials, it is important to remember that the materials mentioned in this paper are by no means complete. Additionally, potential Nano-applications will be addressed for their potential utility in treating SARS-CoV-2, in addition to pertinent details about each type. Overall, the nanoparticle area of science is already vast, but it will continue to evolve in terms of both structure and application in the future. Taking this into account, this paper should serve as a study of existing materials and their clinical applications for viral infections.

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