Antiviral Agents and How They Work

LOS ANGELES, CALIFORNIA, USA, September 11, 2020 / EINPresswire.com/ -- Antiviral agents are drugs that inhibit the spread of viruses, for example by preventing replication of the genome, blocking entry to host cells, or inhibiting viral protein synthesis or viral assembly. The antiviral agents are a large and diverse group of agents that are typically classified by the virus infections for which they are used, their chemical structure, and their mode of action. Scientists and Chemists at VulcanChem work closely with researchers around the globe to discover newer and better antiviral agents.

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Unlike other antimicrobials, antiviral drugs do not deactivate or destroy the microbe (in this case, the virus) but act by inhibiting replication. In this way, they prevent the viral load from increasing to a point where it could cause pathogenesis, allowing the body's innate immune mechanisms to neutralize the virus.

Currently, antiviral therapy is available only for a limited number of infections. Only a few antiviral drugs are reasonably safe and effective against a limited number of viral diseases, and most of these have been developed in people. Most antiviral agents have been developed in the last 20 to 25 years, many as a result of the major research efforts to develop therapies and means of prevention of human immunodeficiency virus (HIV) infection and the acquired immunodeficiency syndrome (AIDS).

The development of antiviral agents is not trivial as viral replication is intricately linked with the host cell that an antiviral drug that interferes even to a lesser extent with host cell factors may be toxic to the host depending on the duration and dosage used. Most antiviral drugs interfere with viral nucleic acid synthesis or regulation. Such drugs generally are nucleic acid analogs that interfere with RNA and DNA production. Other mechanisms of action include interference with viral cell binding or interruption of virus uncoating. Some viruses contain unique metabolic pathways that serve as a target of drug therapy.

Take the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus causing coronavirus disease 2019 (COVID-19) for example. The SARS-CoV-2 genome encodes

approximately 25 proteins that are needed by the virus to infect humans and to replicate. Among these are the notorious spike (S) protein, which recognizes human angiotensin-converting enzyme 2 in the initial stage of infection; two proteases, which cleave viral and human proteins; the RNA polymerase, which synthesizes viral RNA; and the RNA-cleaving endoribonuclease. Finding drugs that can bind to the viral proteins and stop them from working is a logical way forward and the priority of many research laboratories.

Viral diseases represent a real challenge for modern medicine with the recent emergence of new viral threats worldwide such as Ebola, Avian Influenza, MERS, HIV/AIDS, SARS, and now SARS-CoV-2. Reliable sourcing of antiviral compounds remains crucial to support the effective research and development of new preventive and therapeutic cures and regimens to treat infectious diseases.

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