Study Explores Potential of Hepatitis C Drugs to Treat Coronavirus

Several hepatitis C drugs can inhibit the SARS-CoV-2 main protease, a crucial protein enzyme that enables the novel coronavirus to reproduce. VulcanChem Update

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PASADENA, CALIFORNIA, UNITED STATES, November 26, 2020 /EINPresswire.com/ -- The etiological agent of coronavirus disease-19 (COVID-19) is the novel human coronavirus SARS-CoV-2, the origin of which is still being debated. Nonetheless, COVID-19 has become a pandemic of extraordinary proportions, causing worldwide disruptions in travel, economic activity, and social life. Around the world, many antiviral therapies are being investigated for the treatment of COVID-19. These drugs inhibit viral entry (via the angiotensin-converting enzyme 2 [ACE2] receptor and transmembrane serine protease 2 [TMPRSS2]), viral membrane fusion and endocytosis, or the activity of the SARS-CoV-2 3-chymotrypsin-like protease (3CLpro) and the RNA-dependent RNA polymerase.

In a recent study, experiments led by researchers at the Department of Energy's Oak Ridge National Laboratory have determined that several hepatitis C drugs can inhibit the SARS-CoV-2 main protease, a crucial protein enzyme that enables the novel coronavirus to reproduce. The study, published in the journal Structure, is part of efforts to quickly develop pharmaceutical treatments for COVID-19 by repurposing existing drugs known to effectively treat other viral diseases. According to this study, hepatitis C drugs bind to and inhibit the coronavirus protease, which is an important first step in determining whether these drugs should be considered as potential repurposing candidates to treat COVID-19. The SARS-CoV-2 coronavirus spreads by expressing long chains of polyproteins that must be cut by the main protease to become functional proteins, making the protease an important drug target for researchers and drug developers.

In the study, the team looked at several well-known drug molecules for potential repurposing efforts including leupeptin, telaprevir, narlaprevir and boceprevir. Their study yielded promising results for certain hepatitis C drugs in their ability to bind and inhibit the SARS-CoV-2 main protease -- particularly boceprevir and narlaprevir. Leupeptin exhibited a low binding affinity and

was ruled out as a viable candidate.

The study also sheds light on a peculiar behavior of the protease's ability to change or adapt its shape according to the size and structure of the inhibitor molecule it binds to. Pockets within the protease where a drug molecule would attach are highly malleable, or flexible, and can either open or close to an extent depending on the size of the drug molecules.

The list of anti-hepatitis C compounds studied in the research and other anti-hepatitis C compounds currently available for research use can be at VulcanChem Updates.

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