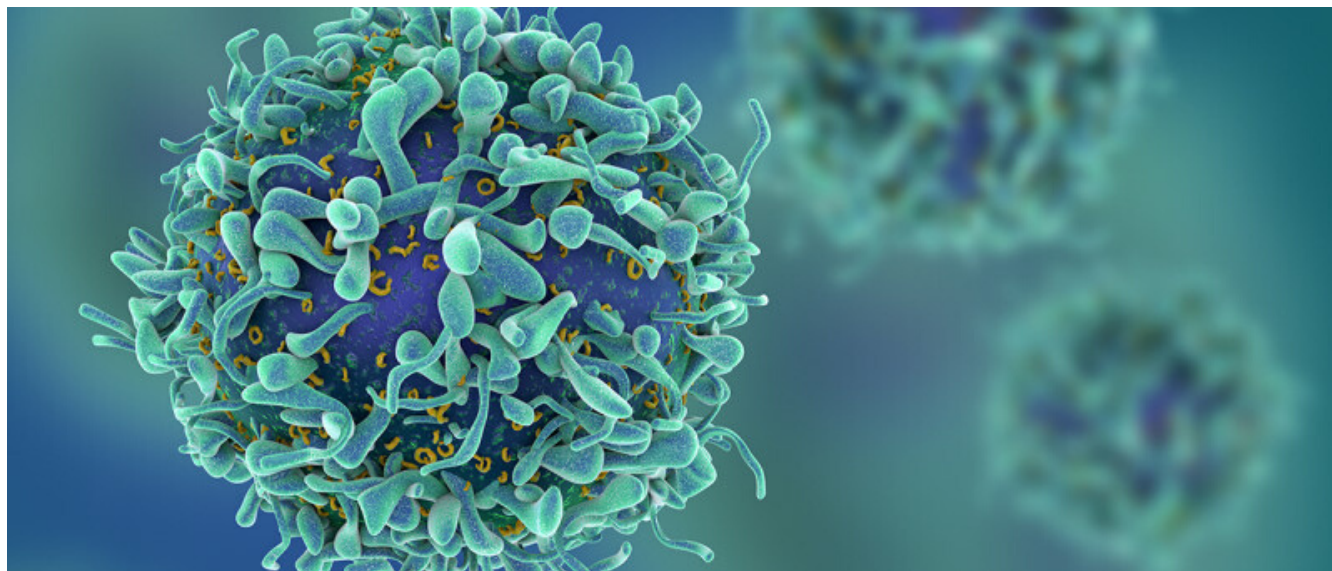


SCICATALYST

WEEKLY NEWS LETTER



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SARS- COV-2 REQUIRES ENDOSOMES FOR IT'S MECHANISM TO ENTER INTO CELL.

HCQ INCREASES THE PH OF ENDOSOME AND ALTERS THE ACE 2 RECEPTOR REQUIRED FOR SARS-COV-2.

'HYDROXYCHLOROQUINE'

is the new potential drug in treating Covid-19?

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Pandemics are sporadic and deadly usually associated with bacteria or viruses as causative agents. They often cause a high rate of morbidity and mortality, inflicting heavy losses to the world. After the Ebola outbreak in Uganda 2012 now it is Corona which is causing havoc. Reports from WHO (world health organisation) estimates that there are 3 lakhs confirmed cases, 13,049 deaths as of 22/03/2020 associated with this outbreak and the number are growing like a wildfire.

Coronavirus causes pneumonia-like symptoms especially populations of an older age. It spreads primarily through person to person contact. This situation calls for a pressing demand of effective, available, and affordable drugs to control and diminish the pandemic. With no standard therapies and medicines in the horizon, scientific community and doctors are finding their trump card with medications of HIV, malaria and Ebola.



Plaquenil - a drug containing the molecule hydroxychloroquine and normally used as an anti-malarial.

HCQ blocked the transport of SARS-CoV-2 from Early Endosomes to Endolysosomes, which appears to be a requirement to release the viral genome as in the case of SARS-CoV.

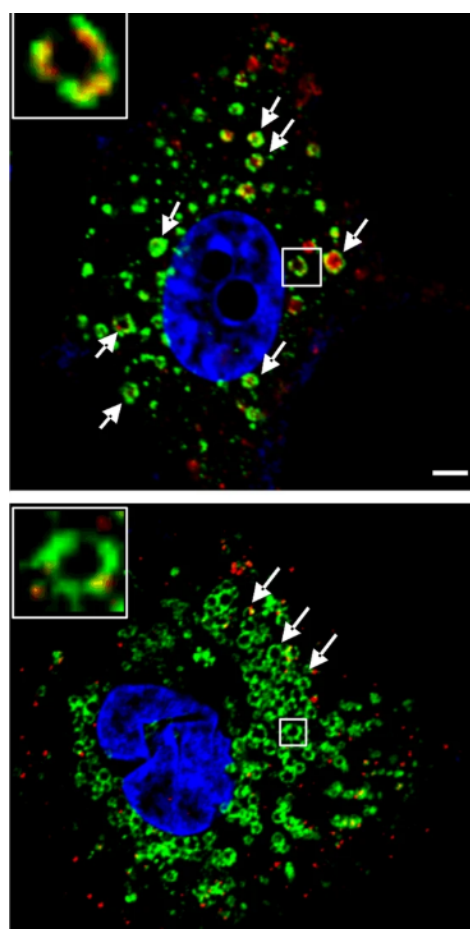
Scientists believe that this drug being a weak base increases the pH of intracellular organelles (endosomes). Low pH is essential for virus-carrying endosomes to fuse with lysosomes. Increasing the pH in endosomes tampers this step which is crucial for viral infection.

In the same study, it has been shown that this drug modifies ACE2 (entry receptor on host cell membrane) and spike proteins (on viral membrane) restricting its binding to cells.

Having said that, Coronavirus patients are shown very high cytokines concentration in the blood which implies inflammation and damage to the body. Hydroxychloroquine is known to have anti-inflammatory effects and have high distribution in lungs, spleen, liver and kidney.

We conclude by saying that, although a high concentration of Hydrochloroquine in the body has proven to be toxic. Combined with its antiviral and immune-modulatory properties, it seems to be a potential drug to treat SARS-Co-V2. This possibility awaits confirmation by clinical trials.

One such medication proving effective in the lab is Hydroxychloroquine (HCQ). It is an anti-malarial drug that is showing positive results against SARS-CoV-2 infection. When the cells are treated with this drug followed by virus binding, low infection rates were observed. While the detailed mechanism by which this drug confers immunity remains elusive.



Representative confocal microscopic images of viral particles (green) on Vero E6 cells (blue).

Source:

Liu, J., Cao, R., Xu, M. et al. Hydroxychloroquine, a less toxic derivative of chloroquine, is effective in inhibiting SARS-CoV-2 infection in vitro. Cell Discov 6, 16 (2020). <https://doi.org/10.1038/s41421-020-0156-0>