

The Site Is A Repository Of More Than 5,240 Articles On COVID-19. Start Navigating From The Homepage To Locate Your Interest. ✕

(<https://www.thailandmedical.news/>)



(<https://www.thailandmedical.news/>)

[ABOUT](#) [CONTRIBUTE \(https://www.thailandmedical.news/p/contribute\)](https://www.thailandmedical.news/p/contribute)

[SPONSORSHIP \(https://www.thailandmedical.news/p/sponsorship\)](https://www.thailandmedical.news/p/sponsorship)

[CONTACTS \(https://www.thailandmedical.news/contactus\)](https://www.thailandmedical.news/contactus)



Source: COVID-19 Research Aug 31, 2020 1 day ago

COVID-19 Research: Inhibiting GFR Signaling Using Drugs Like Pictilisib, Omipalisib, Lonafarnib, And Sorafenib Prevents SARS-Cov-2 Replication In Vitro

NEWS / CORONAVIRUS

29
Shares

Share

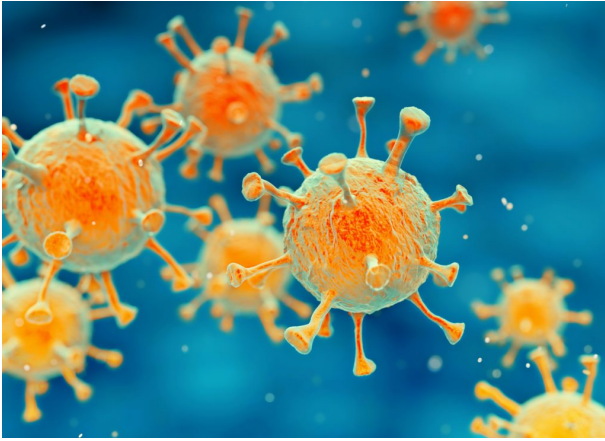
Tweet

Share

COVID-19 Research: Inhibiting GFR Signaling Using Drugs Like Pictilisib, Omipalisib, Lonafarnib, And Sorafenib Prevents SARS-Cov-2 Replication In Vitro

Source: COVID-19 Research Aug 31, 2020 1 day ago

COVID-19 Research (<https://www.thailandmedical.news/>): German Researchers from the Goethe University In Frankfurt have discovered that inhibiting growth factor receptor(GFR) signaling using prominent anticancer druglike pictilisib, omipalisib, RO5126766, lonafarnib, and sorafenib prevented SARS-CoV-2 coronavirus replication in vitro.



The study findings were published in the journal: *Molecular Cell*.

<https://www.sciencedirect.com/science/article/pii/S1097276520305499?via%3Dihub#!>

(<https://www.sciencedirect.com/science/article/pii/S1097276520305499?via%3Dihub#!>)

It has been found that when the novel coronavirus infects a human host cell, it effectively rewires the host cell.

The SARS-CoV-2 virus flips phosphoprotein switches in the host cell's signaling circuitry to ensure that the host cell supports viral activities such as replication.

That a viral infection should entail rewiring is no surprise. However what remains hidden are details such as the identity of the switches that get flipped.

In order to discover these switches and to make sense of host cell signaling and reveal drug targets, and also potentially, useful drugs, the researchers from Goethe University and the University Hospital Frankfurt studied how SARS-CoV-2 brings about phosphorylation-driven signaling changes in infected human cells.

The study team, led by Goethe University's Dr Christian Münch, PhD, and University Hospital Frankfurt's Dr Jindrich Cinatl, PhD, used a comprehensive approach, whole-cell phosphoproteomics.

Simply by identifying all the proteins that were carrying a phosphate group at a given moment, the study team gave themselves the opportunity to recognize which proteins participated in the cell signaling events behind SARS-CoV-2 infections.

Importantly the team discovered that during SARS-CoV-2 infections, growth factor receptor (GFR) signaling and downstream pathways are activated.

Significantly besides identifying the signaling pathways that could be targeted to treat COVID-19, the study team noted that the pathways could be interrupted by existing drugs. Several such drugs, which happened to be anticancer drugs, were shown to be effective in cell models of COVID-19.

Dr Christian Münch told Thailand Medical News, "We manage to determine changes in the cellular phosphoprotein networks upon infection with SARS-CoV-2 to gain insight into infection-induced signaling events. The team found extensive rearrangements of cellular signaling pathways, particularly of GFR signaling. **Strikingly, inhibiting GFR signaling using prominent (anticancer) drugs namely pictilisib, omipalisib, RO5126766, lonafarnib, and sorafenib—prevented SARS-CoV-2 replication in vitro,**

assessed by cytopathic effect and viral RNA replication and release. These compounds prevented replication at clinically achievable concentrations.”

He further added, “Due to their clinical availability, these drugs could be rapidly transitioned towards clinical trials to test their feasibility as COVID-19 treatment options.”

It is already known that phosphate groups play an important biochemical role in the transmission of signals within the cell to stimulate molecular processes that sustain metabolisms or culminate in activities such as cell growth. The phosphate groups are often attached to proteins or removed to control activity. In this process, a change in the protein triggers the next one and the signal is transmitted in a signaling cascade. The target is usually the cell nucleus, where genes are switched on or off.

Utilizing a detailed analysis of phosphate group changes that occur during a SARS-CoV-2 infection, the study team ascertained which signaling pathways were relevant. The team could even supply mechanistic rationales for how signal-adjusting SARS-CoV-2 drugs might work, rationales that are seldom available if suggestions for signal-adjusting SARS-CoV-2 drugs come from bioinformatic analyses of genetics or cellular data.

Dr Münch further added, “The signaling pathways of the growth factors can be blocked precisely at the point where the signal from outside the cell docks onto a signal receiver a growth factor receptor. There are, however, a number of very effective cancer drugs that interrupt growth factor signaling pathways slightly further down the cascade, through which the signals of different growth factor receptors are blocked. The team has tested five of these substances on human cells specimens, and all five led to a complete stop of SARS-CoV-2 replication.”

Dr Cinatl added, “We conducted our experiments on cultivated cells in the laboratory. This means that the results cannot be transferred to humans without further tests. However, from trials with other infectious viruses, we know that viruses often alter signaling pathways in their human host cells and that this is important for virus replication. At the same time, already approved drugs have a gigantic lead in terms of development so that it would be possible on the basis of our results and just a few more experiments to start clinical studies very quickly.”

The study results have already led to a few observational studies currently being conducted in Brazil and India but more proper structured clinical trials will be needed.

For more on **COVID-19 Research**, keep on logging to Thailand Medical News.