

Covid 19 and Cellular Hypoxia

by Justin Croft

Understanding oxygen's effect in viral cellular interactions

One well documented pathophysiology of the Covid-19 virus is hypoxia, which results in decreased oxygen availability for tissues. It has been observed in the previous research that hypoxia also affects the susceptibility of host cells to viral infections and can even shape immune response. In the article below a team from CIC bioGUNE in Spain looked at how differing oxygen concentrations affected the binding ability of the spike of SARS-CoV-2 to epithelial cells.

The study indicates that hypoxia may act to inhibit SARS-CoV-2 infection, suggesting that the hypoxia signaling pathway might offer therapeutic opportunities for the treatment of Covid-19.

Major findings

- Hypoxia seems to decrease the attachment of the Covid receptor binding spike protein to epithelial cells.
- Hypoxia caused lack of binding may explain a lowered infection rate.
- Hypoxia reduces cell surface attachment receptors, thus reducing an infection chance

Major conclusion

Overall, the study indicates hypoxia acts to prevent SARS-CoV-2 infection, suggesting that the hypoxia signaling pathway (HIF) might offer therapeutic opportunities for the treatment of the Covid-19 virus-host interaction and viral load.

For further details please read the full [Prieto-Fernandez et al. article here](#).

While this article primarily focused on low cellular oxygen conditions (hypoxia), at Oxford Optronix we believe there is a case to be made that all mammalian cell research should consider the effect oxygen has on cells. Even if not the focus of the research, there is no reason why physiologically relevant oxygen conditions should not be the norm. There are essentially no cell types in the body that grow anywhere near the 138 mmHg O₂ (18%) found within standard CO₂ incubators and thus most research is done in hyperoxic cellular conditions and is not being accounted for.

If you would like more information on how your lab can work under more physiologically relevant conditions feel free to reach out to sales@oxford-optronix.com or review our [HypoxyLab](#) workstation.