MEDIA RELEASE

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COVID-19 research targets human enzymes

Centenary Institute researchers have examined the critical role of human enzymes and the coronavirus in a newly published scientific review article that explores potential strategies for COVID-19 disease treatment and management.

The review article published in the prestigious 'Journal of Diabetes', seeks to explain how the human enzyme dipeptidyl peptidase (DPP4), which is a driver of diabetes severity, could be exacerbating COVID-19.

"COVID-19 is more severe in people who have type 2 diabetes, obesity and related chronic diseases," says Professor Mark Gorrell (Head of the Centenary Institute Liver Enzymes in Metabolism and Inflammation Program) and senior author of the review article.

"We also see more DPP4 made in people with diabetes, obesity and related chronic diseases. Drugs that target DPP4 enzyme activity are regularly taken by many people for type 2 diabetes. Such drugs may have immune system and cardioprotective effects that could be beneficial in COVID-19 cases," he says.

The review article notes that DPP4, which is known to be the key receptor for the MERS-coronavirus (Middle East respiratory syndrome) might also be an additional or alternate port of entry for SARS-CoV-2 into human cells.

"COVID-19 is caused by the SARS-CoV-2 coronavirus, which is similar to SARS-CoV and MERS-CoV. Each of these viruses attach to and enter human cells by binding to specific human enzymes," says Professor Gorrell.

"Recent research suggests that SARS-CoV-2 can bind to both DPP4 and the ACE2 enzyme and so have two ways to infect our lungs and gut. Once we fully understand this process, we may be able to develop a drug that can help disrupt this viral activity," he says.

Professor Gorrell, an expert in human proteases (enzymes that break down proteins) has recently launched a new research program in response to the growing COVID-19 pandemic.

"TMPRSS2 (Transmembrane protease, serine 2) is essential for SARS-CoV and SARS-CoV-2 infection. This protease activates the viral protein on the coronavirus necessary for virus cell entry at the start of viral infection in the human body," he says.

"We are looking to develop a selective TMPRSS2 inhibitor that is both effective and very safe using our expertise and a unique drug screening approach. The successful development of such an inhibitor could be utilised as a novel therapy for both past and current, and possibly future, SARS-CoV coronaviruses."

"I'm optimistic that our research will contribute meaningfully to the global COVID-19 health response," he says.

[ENDS]

Authors: Researchers involved in the DPP4 focused review publication are affiliated with the Centenary Institute, Newcastle University (United Kingdom), Northumbria University and The University of Sydney.

Publication: Covid-19 and co-morbidities: a role for Dipeptidyl Peptidase 4 (DPP4) in disease severity? Published in the Journal of Diabetes.
https://onlinelibrary.wiley.com/doi/abs/10.1111/1753-0407.13052

Images:
Professor Mark Gorrell (image 1) –
https://drive.google.com/file/d/1udaixIQk9TMF07JLxbml92e5ZYQxB_3k/view?usp=sharing
Professor Mark Gorrell (image 2) –
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About the Centenary Institute

The Centenary Institute is a world-leading independent medical research institute, closely affiliated to the University of Sydney and the Royal Prince Alfred Hospital. Our research focuses on three key areas: cancer, inflammation and cardiovascular disease. Our strength lies in uncovering disease mechanisms and applying this knowledge to improve diagnostics and treatments for patients.

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