Discovery could turn the tables on influenza virus

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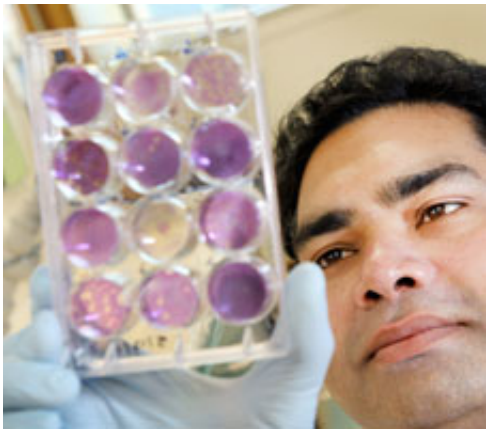

Dr Matloob Husain

(Medical Xpress)—University of Otago virologist Dr Matloob Husain has identified a potential new weapon in the battle against the flu.

His research indicates that host cells, which have a natural ability to restrict viral infection, can be used to combat the influenza virus. His latest findings appear in the October issue of the *Journal of Virology*.

With a mind to the on-going global public health concern presented by influenza virus, Dr Husain and his team study the influenza virus biology with the long-term goal of identifying novel targets for anti-influenza drugs.

"Our approach has been to identify the host proteins involved in influenza virus infection and subsequently exploit them for anti-influenza interventions," he says.

Dr Husain and his team examined the role of one specific host component – histone deacetylase 6 (HDAC6) – and its involvement in the various stages of the influenza virus life cycle.

"The influenza virus uses host cell machinery to replicate itself and cause disease," he explains. "Influenza assembles its progeny at a specific compartment of the host cell. All of the necessary components must be transported to this compartment in order to complete the replication cycle. We have found that HDAC6 exerts its anti-influenza virus function by decreasing the transport of viral components to this compartment thereby inhibiting the virus assembly."

Without all the necessary components needed to assemble its progeny, the virus is unable to reproduce and spread.

Dr Husain says HDAC6 is an important human protein and is already the target of anti-cancer drugs. In addition, several drugs targeting HDAC6 are also under clinical development for the treatment of neurodegenerative diseases such as Alzheimer's and inflammatory disorders.

"Our findings would indicate that anti-viral drugs leveraging HDAC6's natural ability to restrict infection could be developed to combat influenza. Furthermore, an advantage of this approach would be less likelihood of viral resistance."

While the current results were demonstrated using an in vitro cell-culture model system, Dr Husain hopes to secure further funding to replicate the findings in an animal model.

More information: "Histone Deacetylase 6 Inhibits Influenza A Virus Release by Downregulating the Trafficking of Viral Components to the Plasma Membrane via Its Substrate, Acetylated Microtubules." Matloob Husain and Chen-Yi Cheung. *J. Virol*. October 2014 ; 88:19 11229-11239published ahead of print 16 July 2014 DOI: 10.1128/JVI.00727-14

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