Scientists Discover Critical Step in

flu virus infection

Avian flu is in the news. Flu vaccination shortages plagued the United States this year. Research in the college may put a whole new spin on flu prevention. Two researchers in the college's Department of Microbiology and Immunology have found a new step in the pathway that is critical for the flu virus to enter and infect a cell. The discovery could lead to the development of antiviral medications and vaccines that would target all influenza viruses.

Gary R. Whittaker, assistant professor of virology, and Victor C. Chu, a graduate student in comparative biomedical sciences, have published their findings in the *Proceedings of the National Academy of Sciences*. The report is an open-access article, freely available online at www.pnas.org/cgi/reprint/101/52/18153.

The newly discovered pathway occurs after the virus attaches to a cell. The next stage of infection, the scientists say, involves an unknown co-receptor that allows the virus to infect the cell.

"Once we identify the receptor, we expect that a whole new avenue of antiviral medications and vaccines could be developed that would target all influenza viruses, not just one strain at a time," says Whittaker.

Scientists have known for about 50 years how the influenza virus attaches to cells before it infects them. Previous work focused on red blood cells, which are suitable experimental systems for examining virus attachment. However, red blood cells don't have nuclei and can't be infected by the virus.

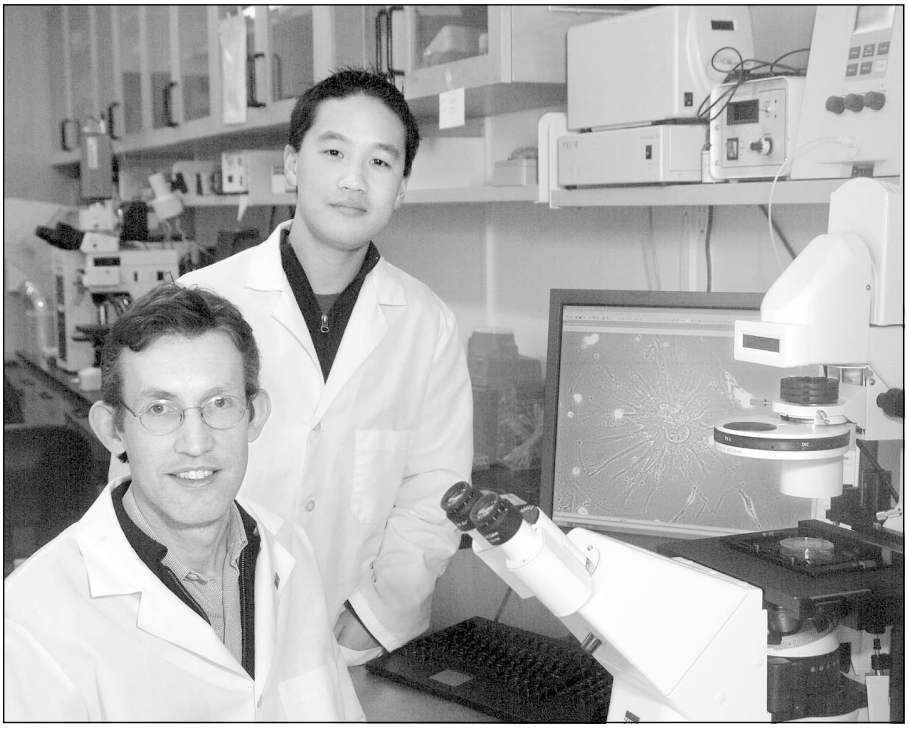
Instead of red blood cells, Whittaker and Chu turned to a line of Chinese hamster ovary (CHO) cells, which have been used since the 1970s to study cell genetics. The normal line of CHO cells get infected—just as all nucleated cells do—but a mutant line of these cells, called Lec1 cells, are deficient in the surface N-linked glycoprotein and are resistant to the influenza virus. The critical factor that protects these cells from infection is the lack of a specific surface receptor comprising N-linked glycoprotein.

Thus, although the influenza virus can still attach to these cells, without the surface N-linked glycoprotein, the virus cannot infect them.

Whittaker points out that the latest influenza discovery is paralleling the research advances with the HIV-AIDS virus about nine years ago, when a second HIV co-receptor was discovered. This enabled researchers to develop new drugs that are now in clinical trials.

The research was supported, in part, by a Career Investigator Grant from the American Lung Association and by a National Institutes of Health grant.

by Susan S. Lang



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Gary R. Whittaker, assistant professor of virology, and Victor C. Chu, a graduate student in comparative biomedical sciences, study the cell biology of influenza.