Compound kills highly contagious flu strain by activating antiviral protein

September 26 2011

A compound tested by UT Southwestern Medical Center investigators destroys several viruses, including the deadly Spanish flu that killed an estimated 30 million people in the worldwide pandemic of 1918.

This lead compound - which acts by increasing the levels of a human antiviral protein - could potentially be developed into a new drug to combat the flu, a virus that tends to mutate into strains resistant to anti-influenza drugs.

"The virus is 'smart' enough to bypass inhibitors or vaccines sometimes. Therefore, there is a need for alternative strategies. Current drugs act on the virus, but here we are uplifting a host/human antiviral response at the cellular level," said Dr. Beatriz Fontoura, associate professor of cell biology and senior author of the study available online in *Nature Chemical Biology*.

According to National Institutes of Health, influenza hospitalizes more than 200,000 people in the U.S. each year, with about 36,000 fatalities related to the illness. Worldwide, flu kills about 500,000 people annually.

In the latest cell testing, the compound successfully knocked out three types of influenza as well as a smallpox-related virus and an animal virus. Because of the highly contagious nature of the 1918 flu, those tests took place at Mount Sinai School of Medicine in New York, one of the few places that stores and runs tests on that flu strain.

The compound is among others that the research team is testing that induce an infection-fighting human protein called REDD1. Until this study, researchers had not demonstrated that REDD1 had this important antiviral function.

"We've discovered that REDD1 is a key human barrier for infection," said Dr. Fontoura, "Interestingly, REDD1 inhibits a signaling pathway that regulates cell proliferation and cancer."

The UT Southwestern-led research team tested 200,000 compounds for those that would inhibit flu virus infection. A total of 71 were identified.

Using the two most promising compounds, researchers at UT Southwestern and colleagues at Mount Sinai next will work to strengthen their potencies for further testing. Dr. Fontoura said it can take more than 10 years before successful compounds are developed into drugs.

Provided by UT Southwestern Medical Center