Viral infections, including flu, could be inhibited by naturally occurring protein

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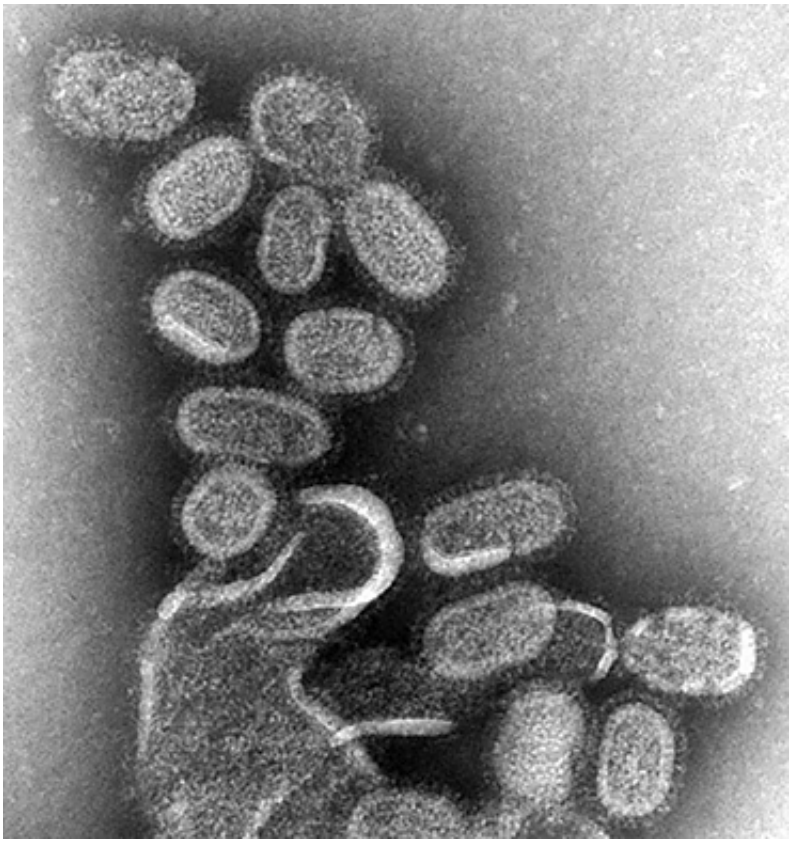

Electron microscopy of influenza virus. Credit: CDC

By boosting a protein that naturally exists in our cells, an international team of researchers led by the University of Pittsburgh Cancer Institute (UPCI), partner with UPMC CancerCenter, has found a potential way to enhance our ability to sense and inhibit viral infections.

The laboratory-based discovery, which could lead to more effective treatments for viruses ranging from hepatitis C to the flu, appears in the June 19 issue of the journal *Immunity*. The research is supported by the National Institutes of Health.

"Despite remarkable advances in vaccination and treatment, diseases caused by viral infections remain among the leading causes of death worldwide," said senior author Saumendra N. Sarkar, Ph.D., assistant professor of microbiology and molecular genetics at UPCI. "We need new defenses against viral infections, and our discovery is proving to be a promising avenue for further exploration."

Dr. Sarkar and his team made the discovery while investigating a protein called oligoadenylate synthetases-like, or OASL, which appears in increased quantities in people with liver cancer caused by the hepatitis C virus.

Hepatitis C, influenza, the childhood respiratory illness RSV, and many other viruses are known as ribonucleic acid (RNA) viruses, which use RNA as their genetic material when they replicate. The OASL protein enhances cells' ability to detect virus RNA, activating the immune system to sense the virus and inhibit replication.

In laboratory tests, boosting this protein in human cells effectively inhibits viral replication. Conversely, mice that do not have OASL were found to be much more susceptible to viral infections.

The finding is especially notable because it may offer an alternative to interferons, another kind of protein that is made and released by cells in response to viruses. Interferons are used in therapy against some viral infections, including hepatitis C, but are not effective for other RNA viruses, such as influenza. Interferon therapy also has major side effects, and not all patients respond well to treatment.

Dr. Sarkar and his team plan to determine the most efficient way to boost the OASL pathway in patients and are working with pulmonologists to develop and identify funding for a study to evaluate the effect of boosting OASL in people with lung infections.

"The respiratory system is a much easier target to deliver this type of therapy, compared to an organ, such as the liver, so we'll be starting with infections like RSV," said Dr. Sarkar. "From there we could branch out to other RNA viruses and perhaps find effective ways to boost our inherent immunity against a broad range of viral infections."

Provided by University of Pittsburgh Schools of the Health Sciences

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