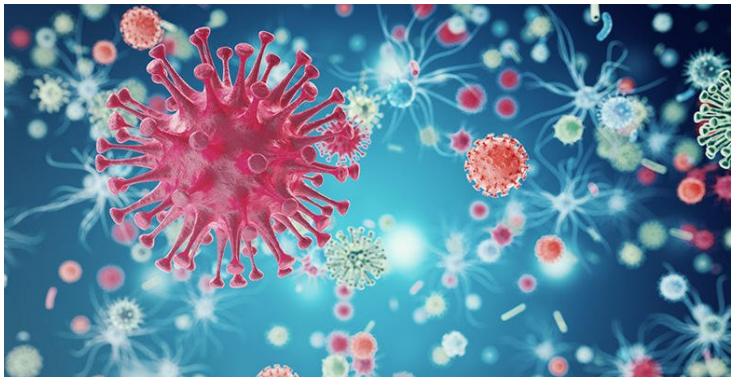
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New enzyme may prevent virus growth

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The newly discovered compound offers a novel approach for attacking many disease-causing viruses.



Dr. Almo and his colleagues at Einstein and Pennsylvania State University have identified how a naturally occurring enzyme in humans and other mammals prevents viruses from multiplying, an advance that may pave the way for new antiviral drugs.

The enzyme viperin, known to have antiviral effects on a wide variety of viruses, including West Nile, hepatitis C, rabies, and HIV, facilitates a reaction that produces the molecule ddhctp, which prevents viruses from copying their genetic material and thus from multiplying.

The discovery could allow researchers to develop a drug that induces the human body to produce this molecule and could act as a broad-spectrum therapy for a range of viruses.

“We knew viperin had broad antiviral effects through some sort of enzymatic activity, but other antivirals use a different method to stop viruses,” said Craig Cameron, a professor at Pennsylvania State University in the US.

The current study reveals that viperin catalyzes the conversion of a nucleotide called CTP (cytidine triphosphate) into a structurally similar compound, or analog: the nucleotide ddhCTP--a previously undescribed molecule that sabotages viral replication.

Researches decoded the effects of ddhctp on a virus’ ability to replicate its genetic material.

“The molecule acts in a similar manner to drugs that were developed to treat viruses like HIV and hepatitis C. With a better understanding of how viperin prevents viruses from replicating, we hope to be able to design better antivirals,” said Cameron.