

New discovery may bring a ‘one-for-all’ treatment for incurable diseases like HIV, Zika, herpes, and RSV

In a major breakthrough, researchers have identified a new class of broad-spectrum antiviral compounds that work by amplifying a cell's own natural defenses, showing effectiveness against viruses like Zika, herpes, and RSV.

A team of researchers just discovered compounds that could lead to a new generation of antiviral drugs capable of fighting many viruses at once. Instead of targeting a specific virus, the new molecules work by activating a powerful defense pathway within the host's own cells.

This approach focuses on a natural cellular defense system called the integrated stress response pathway. Cells normally trigger this pathway to shut down protein production when they detect a viral infection, which stops the virus from replicating. The newly identified compounds act as amplifiers for this response. “If the pathway were turned on in response to viral infection, what our compounds do is they turn it on full blast,” explains Felix Wong, the lead author.

To find these molecules, the team developed a novel screening technique to test nearly 400,000 different chemical compounds. This process yielded several promising candidates. In tests on human cells, these compounds successfully helped the cells fend off infections from RSV, herpes virus, and Zika virus. One of the compounds, IBX-200, also proved effective in mice, where it reduced the viral load and suppress symptoms of a herpes infection.

One interesting thing about this approach is that the compounds appear to have no effect on cells that are not already infected, only activating when a virus triggers the stress response.

*We are very excited about this work, which allows us to harness the stress response of the host cells to arrive at a means to identify and develop broad-spectrum antivirals. — **James Collins**, one of the authors on the paper.*

The team now plans to test the compounds against more viruses in hopes of eventually developing them for clinical trials.

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