

# Scientists find new way to mobilize immune system against viruses

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New research could help in the fight against viral pandemics such as the 2002 SARS outbreak, which led many to wear surgical masks. Credit: Kurt Groetsch, Flickr.

University of British Columbia scientists have uncovered an intricate chain reaction in the body's immune system and have used the knowledge to develop a new treatment against harmful viruses.

Viral pandemics, such as the coronavirus that caused the deadly SARS outbreak in 2002, have caused hundreds of deaths in Canada, yet effective anti-viral drugs are rare.

A key element to this natural immune response is an antiviral protein in the blood called Interferon alpha. Like soldiers, Interferon alpha is quickly deployed by the body to fight viruses and removed just as quickly to restore equilibrium.

As described in the current issue of the prestigious journal *Nature Medicine*, a team led by Overall from UBC's Department of Oral Biological and Medical Sciences and Bruce McManus from UBC's Department of Pathology and Laboratory Medicine has discovered that an enzyme called MMP12 serves double-duty in the deployment of the critical antiviral protein: it first enters the infected cell to activate Interferon alpha and then sends it outside the [cell membrane](#) to fight viruses. After the job of

Interferon alpha is done, MMP12 dissolves the protein during the healing process.

Overall has developed a new antiviral drug that blocks MMP12 from dissolving Interferon alpha outside the cell, giving the [immune system](#) an added boost by keeping levels of the protein high in the bloodstream. The drug cannot penetrate cell membranes, making it unable to interfere with the beneficial work inside the cell. The drug has been shown to effectively treat viral infections in mice models and holds promise as a new broad-spectrum antiviral treatment.

"Because the drug isn't virus-strain specific and boosts the body's own [immune response](#) to fight infections, it could be effective for even emergent, unknown viruses and eliminate the lag time required to first identify and sequence the virus genetic material before we can treat it," says Overall.

**More information:** Paper:

[www.nature.com/nm/journal/vaop...3508.html#affil-auth](http://www.nature.com/nm/journal/vaop...3508.html#affil-auth)

Provided by University of British Columbia

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