

# Research uncovers life-saving benefits in the battle against viruses

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At-risk patients, such as those with HIV or transplant recipients, could benefit from potentially life-saving study carried out by a University of Surrey led group of international researchers.

The research, led by Professor Vince Emery, Senior Vice-President (Global Strategy and Engagement) and Professor of Translational Virology at the University of Surrey, has developed a model that will provide vital insight into how best to help patients with Cytomegalovirus (CMV) infection, particularly those who have undergone organ transplantation.

CMV can be serious if the patient's immune system is not fully functioning, as in transplant patients on immune-suppressant drugs, or for HIV patients in the advanced stages of AIDS. In these cases, CMV can cause major health problems, affecting a range of organs and contributing to early death, which obviously makes it vital to understand how to control the virus.

The mainstay of therapy for CMV has been an antiviral drug called Ganciclovir, which mimics the building blocks of DNA and stops the virus from replicating. In the current study, the researchers used information from a large clinical trial of Ganciclovir for the treatment of CMV disease in patients who had undergone solid organ transplantation, to assess the patterns of viral responses seen following therapy.

This is the first time that a comprehensive model has been developed

which explains the full range of post-therapy virus decline patterns. It provides vital insight into how to best help patients with CMV infection, especially after solid organ transplants and is potentially extendable to stem cell transplant patients.

The researchers have identified four unique patterns of response and have then used this to develop a sophisticated mathematical model which can accurately account for these patterns of decline.

The researchers' work also benefits patients by leading the way forward to personalised medicine, and will make it possible to predict the likely duration of therapy needed for a patient with CMV infection to clear the virus.

Professor Emery said: "I am very proud to have led this vital research, as it will improve the health and quality of life of patients with CMV infection. CMV is a member of the herpes virus family and related to the virus that causes cold sores; these viruses are widespread and usually harmless.

"But in some at risk cases, such as when the [patients'](#) immune system is not fully functioning, it could mean the difference between life and death. "It's vital to understand how the [virus](#) reproduces itself in the human system and how we can control it with antiviral therapy, so we can manage CMV appropriately and ensure its effects can be minimised or completely prevented."

**More information:** Jessica Rose et al, Novel decay dynamics revealed for virus-mediated drug activation in cytomegalovirus infection, *PLOS Pathogens* (2017). [DOI: 10.1371/journal.ppat.1006299](https://doi.org/10.1371/journal.ppat.1006299)

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