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Researchers find that certain anti-influenza compounds also inhibit Zika virus infection

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Researchers from the University of Helsinki have shown that three anti-influenza compounds effectively inhibit Zika virus infection in human cells. The results provide the foundation for development of the broad-spectrum cell-directed antivirals or their combinations for treatment of Zika and other emerging viral diseases.

Globalization, environmental changes, population growth and urbanization make emerging virus diseases a major threat to public health. An example of such epidemics is the Zika outbreak which is ongoing in the Americas after emerging in the Pacific region.

Zika infection associated with congenital brain abnormalities is one of the eleven virus diseases that, according to World Health Organization, needs urgent research and drug development attention. At the moment, there are no approved therapies for Zika infection.

Several host cell targets are needed for replication of influenza and many other viruses. In contrast to viral proteins, the host targets are less prone to mutations and thus drugs targeting them could be more effective against viruses, which mutate easily.

A team led by Dr. Denis Kainov from the Institute for Molecular Medicine Finland (FIMM) and Professor Olli Vapalahti from the Departments of Virology and Veterinary Biosciences, from the University of Helsinki, decided to adopt this approach to test cell-directed compounds for treatment of Zika. In their recent study,

published online in the Antiviral Research journal, the researchers showed that antivirals which block influenza virus by targeting host cell factors are also able to inhibit Zika virus infection.

The multinational research group utilized a model system where human retinal pigment epithelial cells were infected with Zika virus strain they isolated earlier from fetal brain[T1] . They were able to show that treatment of the cells with three drugs, called obatoclax, saliphenylhalamide and gemcitabine, prevented synthesis of viral building blocks and production of new viruses at concentrations that are not toxic to cells.

"Our results show that these antiviral drugs and their combinations are potent inhibitors of Zika virus-host cell interaction. Furthermore, the results broaden the spectrum of antiviral activity of these compounds and shed new light on their mechanisms of action," said Dr. Kainov.

"Importantly, the findings of the study demonstrate that re-purposing commercially available, approved drugs or drug candidates may accelerate development of treatment against Zika and can provide a toolbox to target also other emerging viral diseases," Prof. Vapalahti added.

More information: Suvi Kuivanen et al. Obatoclax, saliphenylhalamide and gemcitabine inhibit Zika virus infection in vitro and differentially affect cellular signaling, transcription and metabolism, *Antiviral Research* (2017). DOI: 10.1016/j.antiviral.2016.12.022

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