

Harnessing anticancer drugs for the future fight against influenza

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In search for novel antivirals, a total of 201 host-directed compounds were tested for their antiviral efficacy. Credit: FIMM / Oxana Denisova

Medical Systems Virology group at the Institute for Molecular Medicine Finland (FIMM) at the University of Helsinki, together with its national and international collaborators, developed a new cell screening method that can be used to identify potential anti-influenza drugs. The researchers were able to identify two novel compounds with anti-influenza activity, obatoclax and gemcitabine and prove the efficacy of a previously known drug saliphenylhalamide.

The study was recently accepted for publication in the [Journal of Biological Chemistry](#) and is now available online.

Influenza viruses cause significant human morbidity and mortality. To

treat the infections, different virus-directed drugs have been developed. However, the currently available drugs are targeting [viral proteins](#) and due to a high [mutation rate](#) the influenza viruses quickly develop resistance to them. For that reason, next-generation antiviral drugs should be directed towards the host functions. The results of this study provide a foundation for development of next-generation antiviral drugs. Furthermore, these identified compounds can be used as chemical tools when studying the molecular mechanisms of virus-host interactions.

"An interesting aspect of this study is that the antiviral effects of obatoclox, saliphenylhalamide and gemcitabine, which all are either investigational or approved anticancer agents, are achieved at much lower concentrations than that needed to mediate cancer cell death" said the group leader Denis Kainov.

However, further research is still needed before these drugs can be clinically tested and applied in influenza infections.

This research project is a good example of repurposing of drugs, i.e. finding new applications for existing drugs and thus saving money and time on drug development.

"We anticipate that these types of drugs could in the future reinforce the therapeutic arsenal and address the needs of the society to control [influenza outbreaks](#)", said Olli Kallioniemi, the Director of FIMM.

More information: Denisova OV, Kakkola L, Feng L, Stenman J, Nagaraj A, Lampe J, Yadav B, Aittokallio T, Kaukinen P, Ahola T, Kuivanen S, Vapalahti O, Kantele A, Tynell J, Julkunen I, Kallio-Kokko H, Paavilainen H, Hukkanen V, Elliott RM, De Brabander JK, Saelens X and Kainov DE. Obatoclox, saliphenylhalamide and gemcitabine inhibit influenza A virus infection. *Journal of Biological Chemistry*, 2012 (online, [doi:10.1074/jbc.M112.392142](https://doi.org/10.1074/jbc.M112.392142))

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