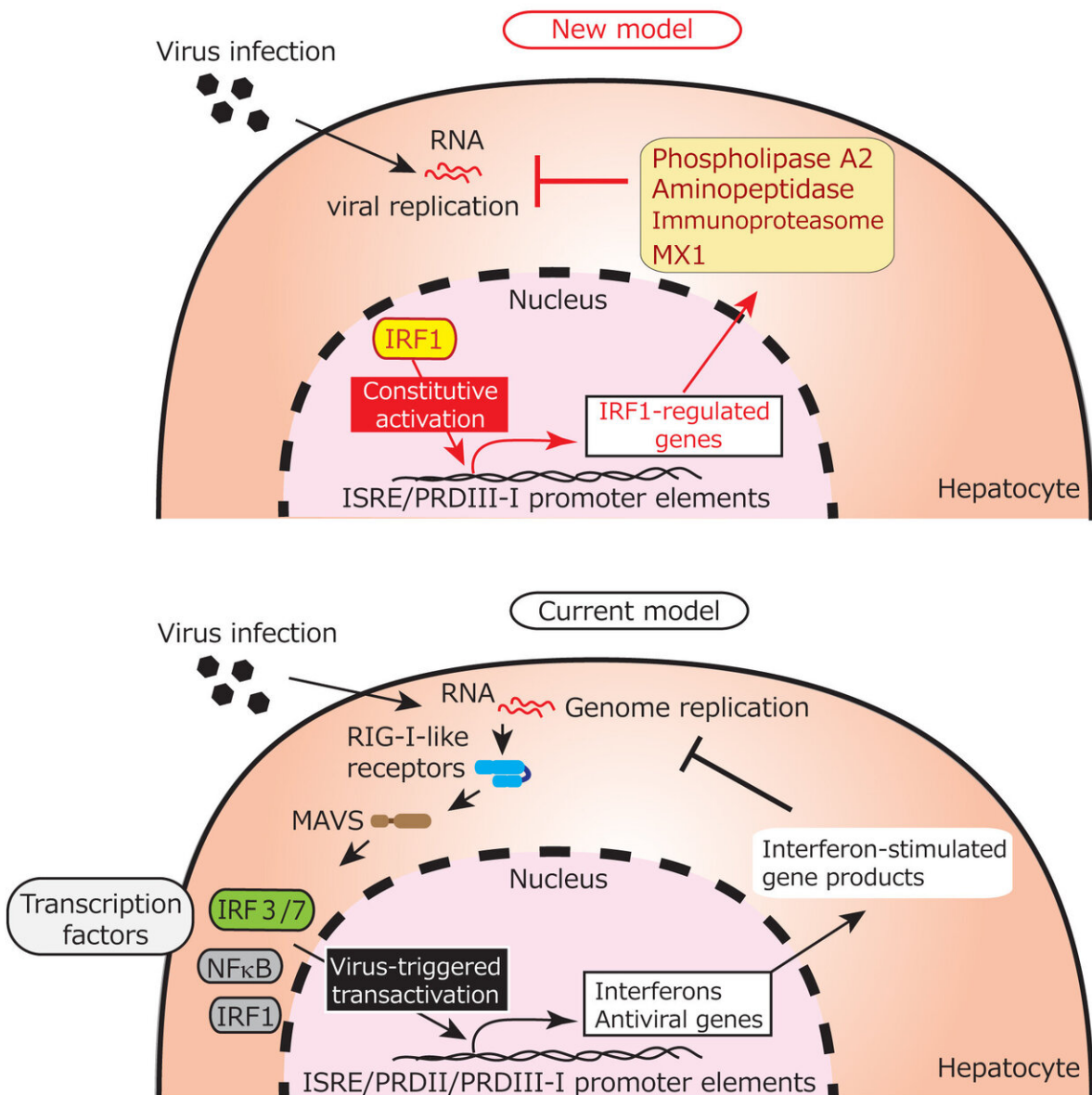


Researchers identify how liver cells protect against viral attacks

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The new versus current models showing how liver cells respond to RNA viruses.
Credit: Daisuke Yamane, D.V.M., Ph.D., Tokyo Metropolitan Institute of
Medical Science

Liver cells have an innate resistance to RNA viral infections like hepatitis A, dengue and Zika thanks to a protein called IRF1, according to researchers at the University of North Carolina at Chapel Hill (UNC) and Tokyo Metropolitan Institute of Medical Science (TMIMS). When present in liver cells, this IRF1 protein regulates RARRES3, an enzyme that when expressed in cells where hepatitis A virus is trying to set up shop, will attack the virus. These results were published in *Nature Microbiology*.

"We discovered that IRF1 is a master regulator of intrinsic resistance to viruses in liver cells," said Stanley M. Lemon, M.D., the study's co-author and a professor of medicine, microbiology and immunology in the UNC School of Medicine. "If present in liver cells, IRF-1 ensures that RARRES-3, an enzyme that acts on lipids, makes the cell hostile or restrictive to hepatitis A infection."

In 2019 alone, there have been several outbreaks of hepatitis A throughout the United States, including Florida, Ohio and California. Hepatitis A infection occurs through consuming contaminated food and water, sex, and injection drug use. The infection can be fatal. There is a very effective and safe two-shot vaccine for hepatitis A virus. However, people who have not been immunized remain at risk for infection.

"We also found that while expressing RARRES3 is protective against hepatitis A infection, it does not help liver cells resist an attack from other RNA viruses like dengue," said Daisuke Yamane, D.V.M., Ph.D., the study's co-author who was previously a research associate at UNC

and is now chief researcher at the Tokyo Metropolitan Institute of Medical Science's Viral Infectious Diseases Project. "In future studies, we hope to further investigate this innate immunity of [liver cells](#) to regulate infection through IRF1 and to better understand why IRF1 sparks certain cellular functions to guard against particular RNA viruses."

More information: Basal expression of interferon regulatory factor 1 drives intrinsic hepatocyte resistance to multiple RNA viruses, *Nature Microbiology* (2019). [DOI: 10.1038/s41564-019-0425-6](https://doi.org/10.1038/s41564-019-0425-6) , www.nature.com/articles/s41564-019-0425-6

Provided by University of North Carolina at Chapel Hill

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