



New Influenza B Virus Enables Real-Time Tracking of Disease Progression

WARF: P160032US01

Inventors: Andrew Mehle

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a new influenza B reporter virus for measuring viral replication in culture and *in vivo* imaging of infected animals.

Overview

Influenza infections in humans, from the common seasonal flu to the deadly pandemics of the 20th century, are caused chiefly by influenza A and influenza B viruses. Understanding the *in vivo* dynamics of viral infection could lead to improved ways of treating or preventing influenza, but existing models relied on proxies to measure viral replication or on analyses performed after the animal model was sacrificed. It was not possible to follow viral load and spread throughout the course of infection in the same animal.

Then, a UW–Madison researcher developed an influenza A reporter virus with the NanoLuc (NLuc) luciferase reporter gene. The reporter virus has been used in bioluminescent imaging to track infections in real time in infected mice and ferrets. Because this approach is non-invasive, it enables serial observations of viral load and dissemination in animals, even following clearance of a sublethal challenge. However, an equivalent reporter virus for influenza B has not been available, until now.

The Invention

The UW–Madison researcher extended his earlier technology and developed a novel, fully replication competent influenza B reporter virus. It is useful for fast and quantitative measures of viral replication in culture as well as tracking disease progression in infected animals. Importantly, while the present technology is directed at influenza B, the approach is adaptable to any strain of influenza A or B.

The virus stably maintains the NLuc reporter gene, replicates with near-wild type kinetics in culture and is suitable for *in vivo* imaging of infected mice. Unlike currently available influenza B models, it is high throughput, does not use laborious culture-based assays to detect viral dissemination and load and does not require sacrificing animals.

Applications

- Understanding the progression and ecology of influenza B infection
- Studying influenza dynamics
- Rapidly assessing the effects of therapeutic interventions for influenza B

Key Benefits

- Allows real-time, *in vivo* imaging of disease progression in living animals
- Maintains viral pathogenicity
- High throughput

- Can be used to more quickly determine the amount of infectious influenza virus

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- Enables fast and quantitative measures of viral replication in culture

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Stage of Development

This technology has successfully been used to visualize influenza B virus infection *in vivo* and monitor local and potentially systemic viral spread.

Additional Information

For More Information About the Inventors

- [Andrew Mehle](#)

Related Technologies

- [See WARF reference number P130288US01 for the researcher's influenza A reporter virus.](#)

Publications

- Mehle A. 2015. Fiat Luc: Bioluminescence Imaging Reveals In Vivo Viral Replication Dynamics. PLoS Pathog. 11, e1005081.
- Karlsson E.A., Meliopoulus V.A., Savage C., Livingston B., Mehle A. and Schultz-Cherry S. 2015. Visualizing Real-Time Influenza Virus Infection, Transmission and Protection in Ferrets. Nat. Commun. 6.
- Tran V., Moser L.A., Poole D.S. and Mehle A. 2013. Highly Sensitive Real-Time In Vivo Imaging of an Influenza Reporter Virus Reveals Dynamics of Replication and Spread. J. Virol. 87, 13321-13329.

Tech Fields

- [Research Tools : Detection](#)

For current licensing status, please contact Jennifer Gottwald at jennifer@warf.org or 608-960-9854

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