



Influenza Reporter Virus Imaged *In Vivo*

WARF: P130288US01

Inventors: Andrew Mehle

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a bioluminescent influenza virus that can be visualized in living animals throughout the course of infection.

Overview

Currently, it is not possible to visualize the *in vivo* dynamics of an influenza infection. All existing models rely on proxies to measure viral replication (e.g., viral concentration in nasal washes) or analyses of dead test animals. Thus, the growth and spread of the virus cannot be followed throughout the course of infection.

The Invention

A UW–Madison researcher has engineered an influenza virus carrying an exceptionally small and bright NanoLuc (NLuc) bioluminescent reporter, allowing it to be imaged during infection. Unlike prior attempts, the new reporter virus replicates almost exactly like the natural virus.

It was created by fusing NLuc to the virus' PA gene. PA and NLuc are separated by a self-cleaving peptide, ensuring that they don't interfere with each other and are expressed as separate polypeptides.

Applications

- *In vivo* virus imaging
- Rapidly assessing drug candidates
- Vaccine efficacy testing
- The reporter potentially could be grafted onto any influenza virus, helping in the study of drug-resistant mutants, highly pathogenic strains or novel viruses that emerge during a pandemic.

Key Benefits

- Reveals the dynamics of infection in real time
- Exquisitely sensitive – detects low level replication in sublethal infections
- Replicates and expresses PA protein much like the natural virus
- Faster than proxy techniques (plaque assays or TCID50 experiments)

Stage of Development

Live mice were infected with the reporter virus and visualized with an IVIS imaging system. Robust luminescence was detected

throughout the lungs beginning two days after infection. In sublethal infections, this luminescence declined over time corresponding to clearance of the viral infection. Moreover, the rate of weight loss was identical for mice infected with normal virus and the reporter virus, indicating the reporter virus retained pathogenicity.

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Additional Information

For More Information About the Inventors

- [Andrew Mehle](#)

Publications

- 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.

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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