

Reverse Genetics Approach for Generating Ebola Virus and Other Filoviruses from Cloned DNA



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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a reverse genetics approach for generating Ebola virus entirely from cloned cDNA.

OVERVIEW

Ebola virus, a negative strand RNA virus in the family *Filoviridae*, is among the most lethal human pathogens. Efforts to develop treatments for Ebola infections have been hampered by a lack of effective ways to experimentally mutate the virus.

THE INVENTION

Kawaoka and his colleagues have now developed a reverse genetics approach for generating Ebola virus entirely from cloned cDNA. They prepared the full Ebola genome through reverse transcription of viral RNA, followed by PCR amplification and cloning of Ebola cDNA. They then successfully produced infectious viral particles by transfecting host cells with plasmids carrying Ebola cDNA, along with plasmids expressing Ebola proteins L, NP, VP30 and VP35 (needed for transcription and replication of negative strand RNA viruses), and one encoding the T7 RNA polymerase.

The researchers also used the system to make mutant virus particles containing an altered furin recognition motif. Furin cleaves Ebola virus glycoprotein at a highly conserved sequence motif, an event hypothesized to be critical to viral pathogenicity. However, viral particles carrying the altered motif still showed pathogenicity and ability to replicate in culture. This result illustrates the system's utility for hastening our understanding of the Ebola virus life cycle and the development of anti-viral agents.

APPLICATIONS

- Discovering methods of preventing or treating filovirus infection, including Ebola infection

THE WARF ADVANTAGE

Since its founding in 1925 as the patenting and licensing organization for the University of Wisconsin-Madison, WARF has been working with business and industry to transform university research into products that benefit society. WARF intellectual property managers and licensing staff members are leaders in the field of university-based technology transfer. They are familiar with the intricacies of patenting, have worked with researchers in relevant disciplines, understand industries and markets, and have negotiated innovative licensing strategies to meet the individual needs of business clients.



KEY BENEFITS

- May be used to prepare any filovirus, including pathogens Marburg virus and Ebola virus, entirely from cloned DNA
- Any mutation can be stably introduced into the Ebola genome, allowing study of pivotal events in the viral life cycle and infection
- Should speed discovery and development of antiviral agents and vaccines
- System may also be used to develop non-infectious vectors for delivering immunogenic or therapeutic proteins into cells

ADDITIONAL INFORMATION

Tech Fields

Pharmaceuticals & Vitamin D - Antivirals

Pharmaceuticals & Vitamin D - Vaccines

CONTACT INFORMATION

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

