

Successful completion of Lassa fever vaccine trial

December 6 2022, by Alan Williams



Credit: Pixabay/CC0 Public Domain

The Vaccine Group, a University of Plymouth spinout company, has successfully completed a project to develop a transmissible vaccine for use in the rats that spread Lassa fever and to reduce its threat to humans.

A small-scale trial of a candidate [vaccine](#) in controlled conditions has shown it could be transmitted between rats and significantly improve their immunity to the disease. Technology has also been developed that has the potential to scale up the vaccine for commercial production.

The work, led by University of California, Davis, saw scientists at The Vaccine Group collaborating with academic partners from around the world.

Their work confirmed Lassa [fever](#) virus to be circulating in Mastomys rat populations in West Africa, and isolated a species-specific cytomegalovirus (CMV) found to be widespread in these populations.

The isolated CMV strains were down-selected based upon growth parameters in vitro, and a candidate vector strain was selected for use as a viral vector for the [vaccine candidate](#).

Two potentially protective antigens were identified from Lassa fever virus, and a lead candidate was selected with a transgene inserted into a single site in the CMV vaccine vector. In addition, a continuous cell line with the potential for commercial scale production of the vaccine was developed from Mastomys rat tissues.

A small-scale trial batch of the candidate vaccine was used in controlled studies under biosecurity containment and shown to be immunogenic in inoculated animals and transmissible to naïve co-housed cagemates.

The vaccine was also shown to reduce Lassa fever virus infection and excretion after challenge at highly significant levels. In addition, the vaccine is constructed to achieve the necessary level of Lassa virus immunity before gradually losing the Lassa virus gene, which restores the vaccine to naturally occurring wild type CMV already present in animals.

Jeremy Salt, TVG Chief Executive Officer, said, "This is a highly successful project that has delivered a range of tools that can be taken forward as part of a control program for Lassa fever in West Africa. From a standing start in 2018, the global project team has pooled resources to enable the development of a candidate vaccine developed from a cytomegalovirus strain that was not even available before the project began.

"The team has created a thorough understanding of the viral ecology in the Mastomys rat population in the region where Lassa fever is endemic. Combining this data has led to an informed computer model for assessment of intervention strategies to aid in the control of this important zoonotic viral pathogen in West Africa."

The Vaccine Group was launched to commercialize the research of Dr. Michael Jarvis, Associate Professor (Reader) in Virology and Immunology at the University of Plymouth, and is developing vaccines based on the CMV virus.

Other herpesvirus-based vaccines the group is developing include those to combat COVID-19, African swine fever, Streptococcus suis (a disease in pigs that can cause meningitis in humans), and porcine reproductive and respiratory syndrome virus.

Its future work linked to Lassa fever will use the vaccine challenge study data to refine the computer model developed to predict the outcomes of Lassa fever control interventions.

Next steps will include further controlled vaccine transmission and efficacy studies, technical transfer of the vaccine production system to a manufacturing partner for scale-up and pilot field studies in Lassa fever virus-endemic regions.

Continued engagement with stakeholders with an interest in the control of Lassa fever in West Africa will be important to identify the environment in which the tools developed by this project can be deployed.

Provided by University of Plymouth

Citation: Successful completion of Lassa fever vaccine trial (2022, December 6) retrieved 27 April 2024 from <https://phys.org/news/2022-12-successful-lassa-fever-vaccine-trial.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.