

A safe live-attenuated virus vaccine hardened against genetic reversion to virulence

06/01/2026



A safe live-attenuated virus vaccine hardened against genetic reversion to virulence

Abstract

This study identifies the genetic changes required for a weakened Junin vaccine virus to regain virulence. That insight guides the engineering of safer, more genetically stable live vaccines with a lower risk of reverting to a harmful form.

Problem

Live-attenuated vaccines can genetically revert to virulence, posing safety and regulatory concerns for their use.

Solution

The technology blocks genetic pathways of reversion by stabilizing the vaccine virus so it cannot regain virulence.

Value Proposition

This technology provides a safer, more stable live Junin virus vaccine option enabling broader use, regulatory acceptance, and protection of at-risk groups.

Benefit

PROBLEM: Live-attenuated vaccines, while often highly effective, carry an inherent safety concern because their weakened viral strains can acquire genetic changes that restore virulence. This risk of genetic reversion complicates regulatory approval, limits widespread deployment, and raises safety concerns for populations at risk, including military personnel, laboratory workers, and communities in outbreak regions. A vaccine that reverts could itself cause disease instead of preventing it.

Researchers from Utah State University and the University of Montana have developed a method to reduce the safety risk posed by live-attenuated vaccines by increasing the genetic stability of the weakened viral strain, so it is far less likely to revert to a disease-causing form.

By addressing the underlying genetic instability, this approach supports clearer regulatory assessment, enables broader and more confident use in at-risk populations, and lowers the chance that vaccination could inadvertently cause illness, thereby improving overall public health protection and operational readiness.

Market Application

This can be applied to the Junin virus treatment market as a tool to improve the Junin virus vaccine. It could also be applied in other vaccine markets to improve viral vaccines.

Inventors

Brian Gowen

Jack Nunberg

USU Department: **Animal, Dairy, and Veterinary Sciences**

USU Reference No. C23025

Intellectual Property

Date: Dec 29th, 2023

Status: Filed