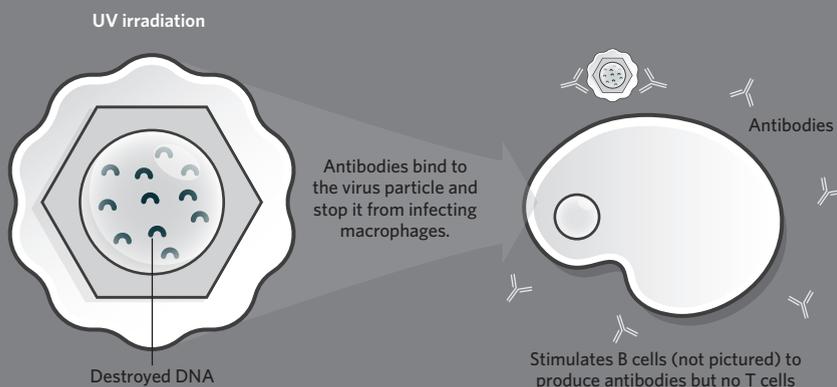


A VACCINE HUNT

Researchers have tested three main approaches to develop a vaccine candidate for the ASFV strain that is currently killing pigs throughout Asia.



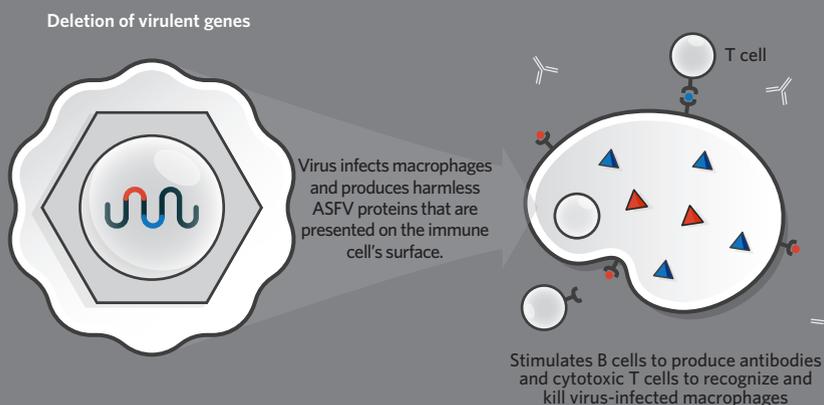
VACCINE STRATEGY #1: INACTIVATED VIRUSES

The traditional approach involves killing or inactivating viruses—for instance, through UV irradiation—so that they're no longer virulent but retain viral antigens that stimulate the production of protective antibodies.

EFFICACY: These vaccines stimulate an antibody response in pigs, but they don't protect against intact forms of ASFV. Researchers think this is because inactivated viruses don't activate killer T cells.

SAFETY: Based on limited studies, no side effects have been shown so far.

COMMERCIAL PROSPECTS: Researchers have abandoned this approach because of the shortfalls in efficacy.



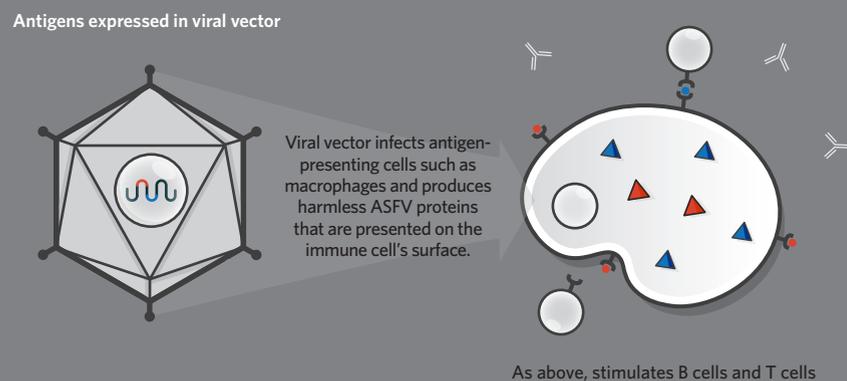
VACCINE STRATEGY #2: LIVE VIRUSES

Injecting tamer forms of virulent viruses could potentially stimulate antibody production and the all-important T cell responses without killing vaccinated animals.

EFFICACY: Both gene-deleted and naturally attenuated forms of ASFV stimulate the immune system to generate antibodies and killer T cells and usually offer protection against virulent genotypes of ASFV.

SAFETY: Vaccinated pigs can develop mild to debilitating symptoms, from fever to joint swelling.

COMMERCIAL PROSPECTS: Researchers are both testing ASFV strains that have naturally attenuated over time and genetically modifying virulent forms of the virus by removing sequences that code for harmful proteins. Scientists have yet to find a stable cell line capable of generating live vaccine candidates in bulk, but these types of vaccines are expected to be the first to hit the market.



VACCINE STRATEGY #3: SUBUNIT VACCINES

A third approach involves genetically engineering viral vectors such as adenoviruses to express combinations of ASFV antigens. Inside the body, the vector-encoded antigens are produced in the absence of the pathogen.

EFFICACY: Inoculations provoke the production of antibodies and killer T cells, but don't seem to protect pigs against virulent forms of ASFV.

SAFETY: Vaccinated animals typically experience few or no side effects.

COMMERCIAL PROSPECTS: Researchers are testing different antigen combinations. Many consider this to be the preferred strategy for developed countries, although it's expected to reach the market much later than live virus vaccines. Subunit vaccines can be easily synthesized in bioreactors and rapidly generated in bulk.