



Recombinant Protein Vaccine for Kennel Cough

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OTHER INFORMATION

KEYWORDS

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protein vaccine

CATEGORIZED AS

- ▶ **Agriculture & Animal Science**
 - ▶ Animal Science
- ▶ **Veterinary**
 - ▶ Companion Animal
 - ▶ Vaccines

RELATED CASES

2026-817-0

BACKGROUND

Canine infectious respiratory disease complex (CIRDC), commonly known as kennel cough, is a highly contagious illness affecting the respiratory tract in dogs. All breeds and ages are susceptible, and, as the name suggests, dogs in settings with multiple other dogs, such as kennels, shelters, and daycares, are at higher risk. Kennel cough is caused by the bacteria *Bordetella bronchiseptica*, which causes respiratory diseases in dogs, pigs, rabbits, and rodents.

Pathogenic *Bordetella* bacteria rely on the protein adhesin filamentous hemagglutinin (FhaB) to bind to host target cells in the respiratory tract. FhaB is highly antigenic, making it an excellent candidate for component vaccines.

Current canine *Bordetella* vaccines are predominantly whole-cell vaccines, consisting of chemically fixed *Bordetella* bacteria, which are administered via nasal aerosol. These vaccines have limited efficacy, requiring administration every 6 to 9 months. Whole-cell fixation can distort bacterial cell surface protein composition and structure with deleterious effects on immunogenicity and the generation of functional antibodies. There remains a need for improved methods of treating and preventing *Bordetella* infection.

DESCRIPTION

Researchers at the University of California, Santa Barbara have created a novel recombinant protein vaccine targeting the FhaB receptor-binding domain that offers improved protection against *Bordetella bronchiseptica*-induced kennel cough in dogs. This innovative vaccine utilizes a purified recombinant segment of the FhaB protein adhesin—the receptor-binding domain (RBD)—to stimulate targeted immune responses against *Bordetella bronchiseptica*.

Unlike traditional whole-cell chemically-fixed vaccines, this component vaccine leverages AI-predicted protein folding to present the antigen in its native conformation, inducing strong antibody production that effectively blocks bacterial adhesion to respiratory epithelial cells. The vaccine promises enhanced immunogenicity, prolonged protection, and can be combined with adjuvants and polypeptides from other pathogens to broaden immunity.

ADVANTAGES

- ▶ Highly specific immune response targeting critical bacterial adhesion mechanism
- ▶ Native folding of antigen improves recognition and antibody efficacy
- ▶ Reduces need for frequent vaccine administration
- ▶ Minimizes epitope masking common in whole-cell vaccines
- ▶ Potential for expanded multivalent formulations with other immunogens

APPLICATIONS

- ▶ Canine preventative vaccination against *Bordetella bronchiseptica* (kennel cough)
- ▶ Vaccines for other veterinary species susceptible to *Bordetella* infections (e.g., pigs, rabbits, rodents)
- ▶ Development of safer, more effective respiratory pathogen vaccines for pets and livestock
- ▶ Adjunct immunogenic components in multi-pathogen vaccine formulations

