



Mazen Animal Health Reports Breakthrough in Valley Fever Vaccine Development

First sub-unit vaccine for Valley fever addresses unmet needs in animal health

St. Joseph, Mo., October 10, 2018 — Mazen Animal Health, a biotechnology company focused on developing and commercializing novel maize-based vaccines and therapeutics that address unsolved challenges in animal health, announces a breakthrough in the development of a first-ever Valley fever sub-unit vaccine for companion animals. In mice, the vaccine was found to reduce the burden of *Coccidioides*, the fungus that can cause Valley fever.

Today, there is no vaccine for Valley fever, in part because the antigen is poorly expressed in microbial systems leading to a high cost of production. With funding from the National Institute of Allergy and Infectious Diseases, part of the National Institutes of Health, (Contract No. HHSN272201600035C), Mazen's technology partner, Applied Biotechnology Institute (ABI) has produced a sub-unit vaccine candidate in maize grain at levels that are a hundred-fold higher than what is possible with traditional fermentation. Maize-produced antigen allows for both injectable and chewable formats for vaccination and sub-unit vaccines are considered one of the safest approaches to vaccines.

Valley fever is a fungal infection that leads to disease not only in humans but also dogs, and other species, including llamas and alpacas. With 12 million dogs in the southwestern United States and an increasing population of camelids at risk, cases of Valley fever are increasing and can be very costly. The disease can last years and is currently treated with expensive anti-fungal medications. In Arizona alone, it's estimated that Valley fever costs dog owners at least \$60 million per year. It can cause severe lung, spleen and bone infection, often leading to death.

"We are thrilled with the early animal-model results showing that the vaccine reduced fungal burden in mice followed by our successful challenge study in mice with this patent-pending product," said Dr. Jenny Filbey, CEO, Mazen Animal Health. "A Valley fever vaccine is a great fit with Mazen's focus on addressing unmet needs in animal health."

About Mazen Animal Health, Inc.

Mazen Animal Health, Inc. is a biotechnology company developing and commercializing novel biological vaccines and therapeutics that disrupt the status quo. We believe all animals should be protected from preventable disease, but today that isn't the case. We intend to change that. Building on over 20 years of R&D, our vaccine production platform enables edible vaccines that can be delivered with feed. We will disrupt the animal vaccine market in four distinct ways, by providing: (1) cost effective vaccines - removing the economic thresholds that control the vaccination decision today; (2) a safer method of vaccine administration; (3) improved vaccine efficacy; and (4) vaccines with a global reach because of ambient temperature stability and ease of delivery.

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