

# AUBURN UNIVERSITY

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Reference: Uniform Vaccine

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### References

[Avian Diseases: March 2015, Vol. 59, No. 1, pp. 106-113](#)

[Avian Diseases: June 2016, Vol. 60, No. 2, pp. 418-423](#)

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## Production of Safe and Uniform Infectious Bronchitis Vaccines

### Overview

Breakouts of infectious bronchitis virus (IBV) in vaccinated chickens continue to cause millions in losses each year for the poultry industry despite worldwide vaccination efforts. Emergence of new Arkansas (Ark) IBV strains has been attributed to vaccine subpopulations that lead to increased genetic diversity and new infectious strains. A method has been developed that removes these subpopulations, producing a uniform and protective vaccine that will help reduce the emergence of Ark-type viruses as well as the number of IBV outbreaks in commercially vaccinated chickens.

### Advantages

- Uses standard cell culture techniques
- Resulting vaccine is stable and can be easily integrated into scale up protocols
- Does not reduce the protective capacity of the vaccine strain
- Safer vaccine may prevent or reduce outbreaks of IBV variants in vaccinated chickens

### Description

Most outbreaks of IBV respiratory disease during the last decade in the U.S. have been caused by Ark-type strains in spite of extensive vaccination. Because commercially available Ark IBV vaccines can have heterogeneous viral populations, the predominant population is selected against after vaccination while minor subpopulations become predominant. The high number of Ark-like viruses obtained from Ark-vaccinated chickens suggests that the vaccine subpopulations likely contribute to later outbreaks of novel variants causing economic losses. Using standard lab viral techniques, a commercial vaccine population containing five subpopulations was reduced to a single homogeneous viral population in two weeks. This refined, uniform population is stable as it did neither revert to other variants after vaccination in chicken nor after back passage in embryonated eggs. The refined vaccine effectively protected against wild Ark challenge virus. In addition, no selection of subpopulations in the challenge virus was seen in chickens vaccinated with this homogeneous vaccine. This method could be easily added to current production protocols with minimal change to existing workflow. Though demonstrated using an Ark IBV vaccine, this method may produce similar results with vaccines against other IBV strains.

### Status

- Pending US Patent [14/887,965](#) and PCT [WO2016064841](#).
- Homogenized vaccine shown to be stable and protective in chickens
- Method was validated using a commercially available embryo attenuated ArkDPI vaccine

### Licensing Opportunities

- This technology is available for exclusive or non-exclusive licensing
- Partnering opportunities include licensing and funded development

#### Diversity in Ark IBV populations after challenge.

Four days post-challenge with the same wild Ark IBV strain, virus was isolated and sequenced from chickens previously immunized using commercially available vaccines. S1 amino acid sequences were used to identify different viral populations. Depending on the vaccine used, different populations of IBV could be detected. N/C = unvaccinated/challenged. A, B, or C = commercially available attenuated Ark-type vaccines. P1 = the predominant challenge virus population. P2-P5 = viruses encoding nonsynonymous amino acid changes in the S1 glycoprotein.

