

EVALUATION OF CROSS-GENOTYPE NEUTRALIZATION OF AVIAN REOVIRUSES BY VACCINE-INDUCED ANTIBODIES

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Background: Avian reovirus (ARV) is an economically significant poultry pathogen with seven genotypic cluster groups (CGs) identified to date, yet commercial vaccines are exclusively based on CG1 strains. Although well studied in some regions of North America, circulating strains in Atlantic Canada remain uncharacterized.

Hypothesis: Genetically and antigenically distinct ARVs are present in Atlantic Canada, and vaccine-induced antibodies will show reduced neutralizing activity against non-CG1 strains.

Objectives: 1) Identify ARV strains circulating in Atlantic Canada.

2) Determine whether commercial vaccine-induced antibodies are neutralizing against multiple CGs.

Methods: ARVs were isolated from samples collected from clinical cases across Atlantic Canada. Viral RNA was extracted, and the sigma-C gene was amplified by PCR, sequenced, and characterized by phylogenetic analysis. In addition, serum samples were collected from vaccinated broiler breeders and layers, and broilers from vaccinated breeders. ARV antibody titers were measured by ELISA, classified as high, medium, or low, and samples were pooled accordingly. Viral neutralization activity of different titer groups from each population was evaluated against ARVs from different CGs.

Results: Of the ten ARV isolates analyzed, eight belonged to CG1, one to CG6, and one to CG7. ELISAs detected predominantly positive antibody titers, with considerable variation among individuals. High-titer serum showed greater neutralizing activity against CG1 isolates than medium- or low-titer serum. Serum neutralizing titers against non-CG1 strains were negligible or zero.

Conclusion: Multiple CGs are circulating in Atlantic Canada. Despite high antibody titers in vaccinated birds, the antibodies showed low neutralizing activity against non-CG1 strains, indicating poor cross-protection.

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