Infectious bursal disease is a highly contagious and immunosuppressive disease in young chickens. It is caused by infectious bursal disease virus (IBDV) a member of the family Birnaviridae. IBDV is a double-stranded non-enveloped RNA virus targeting proliferating B-lymphocytes in chickens. As consequence IBDV causes humoral immunosuppression in chickens. Thus, IBDV increases the risk of diseases caused by facultative pathogens and failures of vaccinations. This virus is ubiquitously present in poultry flocks worldwide. Intensive vaccination programs and presence of field viruses leads to emergence of antigenically different IBDV due to antigenic drift. Thus, determining the antigenicity of IBDV plays a critical role for selecting efficient vaccine strains. Based on our previous studies we established a database including field strains from US poultry companies. This database was based on the nucleotide sequence, amino acid sequence and reactivity with a panel of monoclonal antibodies. The techniques for antigenic characterization of IBDV have not been developed in many countries. The objective of our study was to determine the antigenicity of IBDV field strains at a global level. To this end, we combined the use of FTA cards for sending genetic material and reverse genetics to determine the antigenicity of IBDV. FTA cards can be effectively used to transport the nucleic acids of the virus in stable form without the import of infectious virus. By using a modified protocol, RNA was isolated and amplified with specific primers encompassing the appropriate VP2 fragment. The amplified cDNA was cloned into the IBDV reverse genetics system and analyzed for the nucleotide sequence and amino acid sequence. This was followed by reactivity with a panel of monoclonal antibodies to determine the antigenicity. By using this combined approach, IBDV can be antigenically characterized for the first time from bursal samples across the globe.

**Key Words:** infectious bursal disease, antigenicity, FTA cards, reverse genetics, molecular techniques

105 The effect of vectored HVT+IBD (Vaxsitek À HVT + IBD) vaccination on body weights, uniformity and virus shedding in commercial broilers. A. T. Garrity,* Merial Select, Inc., Gainesville, GA.

The introduction of vectored HVT+IBD vaccines has offered an alternative to traditional programs. The current study compared the effect of a vectored HVT+IBD vaccination to mAb on body weight, flock uniformity, and virus shedding in a commercial broiler flock. A flock of day-old broiler chicks were divided into 2 equal groups and placed in a commercial broiler house. The control group was administered Marek’s disease vaccines in ovo at 19 d of incubation. The control group was not vaccinated for IBD. The treated group was administered vectored HVT+IBD in ovo at 19 d incubation. The flock was weighed at 5 time points. At least 200 birds were individually weighed in each test group at each time point. Mean weights and CVs were calculated for each test group. Flock uniformity was calculated as the number of birds within a range of ±15% of the mean weight. At each time point cloacal swabs were collected from 90 birds per group and tested for the presence of IBD virus using rt-PCR. Serum samples were collected from 25 birds per group and tested for IBD antibodies using ELISA. Bursal tissue samples were collected from 6 birds per group. Fresh bursal tissue was tested for IBD virus using AC-ELISA. Formalin-fixed bursal tissues were examined for histopathological lesions of IBD. At 38 d of age, 120 birds per test group were selected for processing. Mean weights and CVs for each test group were determined for live weight, RTG weight, and cut up parts weights (wings, breasts, tenders, legs and racks). Yields were calculated as a percentage of live weight and RTG weight. The treated group had a higher mean weight, lower CV and better uniformity than the control group. The treated group had lower mean bursal scores and better follicular restitution. The treated group had higher geometric mean titers on ELISA at each time point. More birds in the control group were shedding virus at 28 and 35 d. The treated group had higher live, RTG, and cut-up parts weights and higher yields for RTG, wings, breasts and tenders.

**Key Words:** Vaxsitek, IBD, uniformity, shedding

106 Aerosol vaccination of chickens with baculovirus expressed virus-like particles induced immune response in chickens. J. T. Earnest1,2, R. O. Donis3, M. Papania1, J. M. Hossain4, J.-M. Song5, S.-M. Kang6, R. W. Combs7, G. Smith8, H. S. Sellers9, and E. Mundt1,1 Department of Population Health, College of Veterinary Medicine, University of Georgia, Athens, 2 Molecular Virology and Vaccines Branch, Influenza Division, NCIID, CCID, Centers for Disease Control and Prevention, Atlanta, GA, 3 Measles, Rabies, Mumps and Herpesviruses Laboratory Branch, Division of Viral Diseases, NCIRD, CCID, Centers for Disease Control and Prevention, Atlanta, GA, 4 Department of Microbiology and Immunology, Emory School of Medicine, Emory University, Atlanta, GA, 5 Novavax, Inc., Rockville, MD.

Influenza A virus (IAV) vaccination of animals and humans is a powerful tool for prevention and control of infection. Ongoing outbreaks of avian influenza and the recent influenza pandemic highlight the need for improved influenza vaccination approaches. Currently licensed vaccines are egg-based and delivered by injection which is labor intensive. As an alternative vaccine manufacturing method, baculovirus grown in insect cell cultures can be adapted to produce high yields of virus-like particles (VLP) which contain viral proteins but lack genetic material, and thus cannot replicate within the host. VLP vaccines have been shown to be highly immunogenic after parenteral application in mice, ferrets, and humans. Aerosol mass vaccination of poultry with attenuated vaccines is common practice for several diseases, but use of attenuated influenza vaccines in poultry is not practical due to their potential to become more virulent. The aim of this study was to assess influenza VLPs as aerosolized vaccine (AE) in chicken as vaccination method. VLP used in this study were composed either of IAV matrix protein 1 (M1), neuraminidase (NA), and hemagglutinin (HA) from H5N1 AIV or HA and M alone (HNM-VLP or HM-VLP, respectively). Plethysmography was used to determine respiratory parameters for the chickens and to calibrate a controlled VLP aerosol application dose. One-day-old SPF chickens were vaccinated twice 14 d apart. As control, chickens were also vaccinated via intranasal (IN) instillation and intramuscular (IM) injection. Serum samples from 14 d after first vaccination and 14 and 21 d after second vaccination were tested for the presence of neutralizing and HI antibodies, or by indirect ELISA using baculovirus expressed H5-Vietnam as antigen. Both VLPs induced seroconversion after IM application. Chickens given HNM-VLP seroconverted after IN but not aerosol vaccination. In contrast, HM-VLP induced a specific antibody response after AE but not after IN application. These data show for the first time that non-replicating influenza VLPs might be used for mass aerosol vaccination in chickens.

**Key Words:** influenza virus, virus like particle, aerosol, mass vaccination

107 Characterization of monoclonal antibodies directed against avian influenza virus neuraminidase 1 as a new potential treatment for disease. J. L. Jenkins1,2, F. Michel3, R. J. Hogan4, M. Garcia5, and E. Mundt6,1 Department of Population Health, College of Veterinary Medicine, University of Georgia, Athens, 2 Department of Anatomy and Radiology, College of Veterinary Medicine, University of Georgia, Athens.