

# **The Chick Papers**

A Monthly Newsletter from the Georgia Poultry Laboratory

### September 2017

#### Identification of New Strains of Avian Reoviruses

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The Georgia broiler industry (along with many other states) experienced recurrent outbreaks of viral arthritis and runting-stunting cases in 2006, 2011, and 2013 to 2015. Molecular characterization of avian reovirus (ARV) based on nucleotide sequence analysis has been performed in several laboratories over the past few years. In most cases, laboratories report the emerging genotype as the "phylogenetic group" it belongs to. Technically, a phylogenetic group is determined by creating a "tree" based on the sequence information from a particular gene sequence, using several statistical programs. The viruses most closely related to each other are clustered in groups of tree "branches" sometimes seen on schematic representations. The tree represents the relationships of the sequences of the viruses of interest to other sequences from previous cases or outbreaks of viral arthritis (VA) or runting and stunting syndrome (RSS). The phylogenetic trees do not represent the entire story; they are only a tool to estimate genetic or predicted amino acid sequence relationships. Genotype clusters defined by one lab may have been designated with a different name in another laboratory, even though they may be the same or very similar. However, from the poultry producer's perspective this information needs to be translated into simple and easy-to-understand terminology. The emergence of variants tends to occur in high-density poultry producing areas. Poultry producers from a given area may be less interested in knowing that the current isolates are related to yet another geographic area or another state, but they are interested in how closely related their new virus is to the ones contained in the vaccine they are using. Closeness of tree branch clusters is not always a predictor of cross protection.

We recently analyzed several reovirus sequences from the GPLN database<sup>1</sup> and compared them with those published by other researchers<sup>2</sup>, as well as those available in the GenBank public database, with the purpose of evaluating the genetic relationship of emerging isolates with those from previous outbreaks from NE Georgia. In accordance to previous findings (1), all the isolates showed less than 50% similarity to vaccine standard strains (S1133, 1733, and 2177). Three main groups of avian reovirus isolates from Georgia and other regions are as follows:

Phylogenetic group	Description of isolates <sup>2,3</sup>
I	Isolates showing 85-94% genetic identity with 2013, 2014 tenosynovitis cases from GA and PA. These isolates were <52% and <50% similar to the groups 2 and 3, respectively, as described below. Most of the recent cases of 2017 fall into this group.
2	Isolates showing up to 90% similarity to 2005 and 2010 isolates from broilers with runt- ing-stunting cases. These isolates were 52-59% similar to group 3 described below.
3	Isolates in group 3 show 98-100% identity within the group as well as with the isolates from viral arthritis and tenosynovitis cases reported in 2012-2013 from NE Georgia.

In conclusion, new ARV isolates represent a divergent group of viruses (viruses that differ genetically). Generally, with new field reovirus, there is a small proportion of isolates that do not show any genetic identity with previously characterized viruses. Commercially produced autogenous ARV vaccines containing several genotypes were made available in early 2015. Between 2015 and 2017, we have received fewer caser of RSS and VA, although there seems to be a very recent re-emergence of cases.

I Kulkarni, A. The genomic constellation of the S1, S2 and the S3 gene segments from recent avian reovirus isolates associated with viral arthritis and runting-stunting cases in Georgia. Proceedings of the 66<sup>th</sup> Western Poultry Disease Conference, Sacramento, CA, April, 2017.

3 Davis, J. F., Kulkarni, A., and Fletcher, O. Reovirus infections in young broiler chickens. Avian Diseases, 57: 321-325, 2013.

<sup>2</sup> Sellers, H. S. Update on variant reoviruses isolated from clinical cases of viral arthritis/tenosynovitis in broilers. The Poultry Informed Professional (published by the Department of Population Health, University of Georgia, Athens, GA, 127 (Jan/Feb): 1-4, 2013.

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## **Tours and Visitors**

- September 12: Fred & Marty Hoerr
- September 14: Farm Bureau
- September 19: Lanier Village retirees
- September 21: Boehringer Ingelheim
- September 27: Dr. Eric Gingerich, Dave Ogle & Michael Weldon
- September 27: Boehringer Ingelheim
- September 27: BSO Officers
- September 29: ABAC Poultry Club



Lanier Village retirees toured the diorama on September 29.



Boehringer Ingelheim visited the lab on September 21.



Abraham Baldwin Agricultural College toured the lab on September 29.



A second group of representatives from Boehringer Ingelheim toured the lab on September 27.



# Devil is in the Diorama Detail

We are focusing now on the final detailing of the diorama and are very excited to share the progress we have made.

On Friday, October 20, we will have an open house for GPLN friends and family to tour the diorama.

On Saturday, October 21, we will host the yearly pilgrimage of the National Model Railroad Association. This pilgrimage allows NMRA members to visit dioramas all over the region. We are also inviting the poultry industry to visit the diorama during this time.

Please join us and see how far we've come!

