

Abstract of proposed student project (1 page limit. This should mirror the aims page of a grant and CLEARLY indicate the student's role.)

Identifying *Pasteurella multocida* serotypes involved in co-Infections with Epizootic Hemorrhagic Disease Virus and Bluetongue virus in farmed white-tailed deer in Florida.

The deer farming industry is one of the fastest-growing industries in rural America. The industry's total impact on the nation's economy, combining the breeding and hunting components, is \$7.9 billion annually. Presently, Florida has an estimated 400 licensed deer farms in 65 of the 67 counties, with an estimated 32,000 farmed deer. Due to Florida's unique characteristics in terms of climate and topography, deer farming has challenges unique to Florida in terms of animal health. *Pasteurella multocida* has been isolated from various wild animals, including deer. In deer, *P. multocida* has been associated with respiratory infections. The bacteria can be found in the nasal cavities and upper respiratory tracts of healthy deer, but in cases of infection, it can lead to severe respiratory signs and death. *P. multocida* is known to cause coinfections, where it can infect in combination with other microorganisms. In animals, *P. multocida* coinfections are commonly seen in association with viral infections such as bovine respiratory syncytial virus (BRSV), parainfluenza 3 virus (PI3V), and bovine herpesvirus-1 (BHV-1) in cattle and sheep. Currently, we have identified multiple cases of coinfections with Epizootic Hemorrhagic Disease Virus (EHDV) and Bluetongue Virus (BTV) in farmed white-tailed deer from Florida. Coinfections involving viruses are being recognized to influence the disease pattern that occurs relative to that with a single infection.

Prevention and control of *P. multocida* infections in deer populations can be difficult. In captive deer, good hygiene, sanitation, and biosecurity practices may help to reduce the spread of the bacteria. However, currently, there is limited information on which serotypes are most likely involved in deadly coinfection with EHDV and BTV in white-tailed deer. Different serotypes of *P. multocida* have been identified, and they are grouped into several main types: A, B, D, E, F, and L, with distinct prevalence in different species of animals.

The student will retrospectively identify and confirm cases of coinfections in white-tailed deer by *P. multocida* with EHDV and BTV. Stored samples from confirmed cases will be analyzed using qPCR and Sanger sequencing to identify serotype prevalence and will carry out the corresponding data analysis. Obtained results will significantly improve our understanding and help identify the infection's source, predict the infection's clinical outcome, and help us choose appropriate antibiotics and treatment strategies.