Supporting Research in Vector Borne Diseases

Diagnostic services provided under by the Vector Borne Disease Diagnostic Laboratory (VBDDL) are completely self-supported by revenue or donations to the VBDDL. All income derived from diagnostic testing is used to recover costs for reagents, equipment, supplies and for the salaries of the receptionist and technicians who process the specimens submitted for testing. Over the years, we have supported a spectrum of outreach and educational opportunities using the revenues generated as a result of our diagnostic service offerings. As examples, students at all academic levels and from many national and international locations, have been afforded the experience of working in a diagnostic laboratory or have participated in a focused research project related to vector borne infectious diseases of companion animals or wildlife species. We are proud of the fact that many of our undergraduate and graduate students have subsequently pursued careers in research or medicine (both human and veterinary medicine). Interactions with veterinarians throughout the world have led to VBDDL investigations of complicated cases involving single sick animal or disease outbreaks involving entire kennels. *(See pg 2) The VBDDL has frequently participated in these case-based or kennel outbreak studies without taking remuneration into consideration. Unfortunately, there is not a CDC or USDA equivalent for companion animal diseases; therefore there is no infrastructure or established source of funds to address unusual illnesses in pets. With rising costs, our expenses are not always covered by the monthly revenue generated, which may ultimately affect the survival of the VBDDL. If you (or your client) would like to make a donation (tax deductible) in support of our vector borne disease research, outbreak investigations and pro bono consultations provided by the NCSU College of Veterinary Medicine faculty, donations can be made out to "North Carolina State University Veterinary Medical Foundation" with **Vector Borne Disease Research Fund** specified, or online at [https://ccfn.ncsu.edu/advancement-services/giving/VM/](https://ccfn.ncsu.edu/advancement-services/giving/VM/) selecting the Vector Borne Disease Research Fund at “How may we use your gift?”. This fund supports work on Anaplasmosis, Babesiosis, Bartonellosis, Cytaxzoonosis, Ehrlichiosis, Hemotropic Mycoplasmosis, Spotted Fever Rickettsiosis and other emerging infectious diseases.

**Acknowledgements for the work we do on a daily basis are deeply appreciated.**

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**Selected examples of VBDDL associated research:**


- In the summer of 1997, the VBDDL undertook an unfunded investigation of a kennel of sick and dying Walker Hounds routinely used for deer hunting in rural North Carolina. A high degree of co-infection was documented by serology and molecular assays. By PCR, of the 27 dogs, 15 were infected with *Ehrlichia canis*, 9 with *E.chaffeensis*, 8 with *E.ewingii*, 3 with *Anaplasma phagocytophilum*, 9 with *A.platys*, 20 with a *Rickettsia* species, 16 with a *Bartonella* species, and 7 with *Babesia canis*. Both *E. canis* and an uncharacterized *Rickettsia* species appeared to result in chronic or recurrent infection. As an outcome of this study, lessons were learned about the detection of co-infecting species with an appreciation for high risk populations exposed to numerous ticks. Published article: Kordick SK, Breitschwerdt EB, Hegarty BC, Southwick KL, Colitz CM, Hancock SL, Bradley JM, Rumbough R, Mcpherson JT, MacCormack JN. Coinfection with multiple tick-borne pathogens in a Walker Hound kennel in North Carolina. J Clin Microbiol. 1999 Aug;37(8):2631-8.


- Initial description of the demographic and clinical characteristics of feline cytauxzoonosis was obtained through a retrospective study of 34 *C.felis* infected cats. Pancytopenia and icterus were the most common clinicopathologic abnormalities. Thirty-two cats either died or were euthanatized, and 2 cats survived. Data indicated that veterinarians in the mid-Atlantic region of the USA should consider *C felis* infection in cats with fever, icterus, and pancytopenia or bicytopenia. Published article: Birkenheuer AJ, Le JA, Valenzisi AM, Tucker MD, Levy MG, Breitschwerdt EB. Cytauxzoon felis infection in cats in the mid-Atlantic states: 34 cases (1998-2004). J Am Vet Med Assoc. 2006 Feb 15;228(4):568-71.

- The initial recognition of Leishmaniasis in the USA came after a veterinarian north of NYC called concerning fatalities amongst some 120 hounds in a breeding and foxhunting kennel. Upon the suspicion of tick borne disease, serological and molecular testing was requested. Extensive workups, mostly unfunded, on all 120 hounds, including cytology and full necropsies on several at NCSU CVM Teaching Hospital finally resulted in a diagnosis of *L.infantum*. Further epidemiological workups on the part of the CDC defined the outbreak in this kennel and in other foxhound kennels that trained in southern states as an epidemic of Leishmaniasis unrecognized previously in North America. The VBDDL developed specific IFA and PCR assays to address the diagnosis of Leishmaniasis in the future and aided in the screening of all foxhound kennels in the US. Published article: Gaskin AA, Schantz P, Jackson J, Birkenheuer A, Tomlinson L, Gramiccia M, Levy M, Steurer F, Kollmar E, Hegarty BC, Ahn A, Breitschwerdt EB. Visceral leishmaniasis in a New York foxhound kennel. J Vet Intern Med. 2002 Jan-Feb;16(1):34-44.