The Diagnostic Center for Population and Animal Health (DCPAH), part of the Michigan State University College of Veterinary Medicine, will now be the Michigan State University Veterinary Diagnostic Laboratory (MSU VDL). This name change, effective June 1, 2017, will better communicate the function and mission of the unit. The decision to pursue the change was made with the input of laboratory clients, stakeholders, and employees.

“At our heart, we are a veterinary diagnostic laboratory. We are happy to announce this name change, which we feel will better resonate with current and prospective clients, as well as our government and animal health community stakeholders,” says Rachel Reams, director. “We will continue providing our clients with the quality diagnostics they rely on to make critical decisions about the treatment of animals entrusted to their care. At the same time, we remain committed to build and expand our partnerships in the area of One Health.”

In March, DCPAH was promoted to a Level 1 laboratory in the National Animal Health Laboratory Network (NAHLN).

A cooperative effort between two United States Department of Agriculture (USDA) agencies and the American Association of Veterinary Laboratory Diagnosticians (AAVLD), the NAHLN is a nationally coordinated network of federal, state, and university-associated laboratories that provide animal health diagnostic testing to detect biological threats to the nation’s food animals, thus protecting animal health, public health, and the nation’s food supply. Prior to 2016, the original twelve laboratories were designated NAHLN Core laboratories; at that time, DCPAH was a Member laboratory. Beginning in 2016, all NAHLN laboratories were transitioned to a new structure (Levels 1, 2, 3, Affiliate, or Specialty) based on a laboratory capability and capacity assessment, and data verification. In 2016, DCPAH was designated a Level 2 laboratory.

Based on the 2017 assessment, DCPAH met the criteria to be promoted to a Level 1 laboratory. Relevant factors included: full AAVLD accreditation; more than 1,000 square feet of functional and fully-commissioned Biosafety Level 3 laboratory space; a fully functional lab information management system that can actively message test results to the NAHLN; five or more individuals authorized to perform foot and mouth disease (FMD) and avian influenza (AI) testing; surge capacity for greater than 750 tests/day for FMD or AI; NAHLN approval for testing five or more diseases; and testing more than 10,000 NAHLN surveillance samples per fiscal year.

While there are over 60 laboratories in the network, there were only 11 Level 1 laboratories in 2016 compared to 27 Level 2 laboratories. The number of labs per designation for 2017 has not yet been released. However, earning status as a Level 1 laboratory will result in both increased responsibility to the network and USDA funding. Additionally, the laboratory director, Rachel Reams, has been nominated by AAVLD to serve on the NAHLN Coordinating Council.

“We are honored to be recognized as a Level 1 laboratory. This change in status reflects the quality of our testing; our commitment to having staff authorized to test for AI, FMD, chronic wasting disease (CWD), scrapie, swine influenza, and other agents that pose a significant risk to agriculture; the level of surveillance testing we provide for the region; and our active involvement in NAHLN-related activities,” says Reams. “Current surveillance for CWD here in Michigan and AI outbreaks in Asia and Europe as well as the United States underscore the need for laboratories such as ours to protect animals and the public from biological threats.”

The MSU VDL, a service unit in the College of Veterinary Medicine, is a premier, full-service, fully accredited veterinary diagnostic laboratory for all species. On average, the lab performs one million tests per year on approximately 180,000 cases for more than 300,000 animals. The MSU VDL is a member of key federal networks charged with protecting human and animal health, and their core diagnostics, innovative solutions, and expert service have earned them clients in all 50 states, U.S. territories, and more than 20 foreign countries. The lab serves approximately 7,000 clients per year.

You’ll begin seeing our new logo and name on documents and in our facility in June. We aim to make this process as seamless as possible for our clients, but we appreciate your patience as we work to complete this transition.
Ticks and Tick-Borne Diseases: Big Pathogens in Small Packages

By: Steven R. Bolin, DVM, MS, PhD

Anaplasmosis, babesiosis, ehrlichiosis, Lyme disease, and Rocky Mountain spotted fever can be spread by ticks to humans and various species of livestock and companion animals. Ticks are arachnids, not insects. After hatching from an egg, the tick must have a blood meal to advance from one life stage to the next. The four stages in the life cycle of a tick are the egg; which hatches as a small, six legged larva; which molts to become the slightly larger, eight legged nymph; and after the nymph has a blood meal it molts to become an adult tick and the life cycle is completed. Although larva and nymph stage ticks feed on pets and can transmit disease, those life stages are small in size and it can be difficult to find them on a pet. The adult stage is larger in size and is more easily found, especially if the tick is partially engorged with blood. Most ticks submitted to our laboratory are adults.

A Tick for All Seasons

Ticks can be found on pets throughout the year. However, seasonal trends in number of ticks and in species of tick submitted are seen here at the lab. The months from April to July, and October to November are when the highest numbers of ticks are submitted.

The *Ixodes scapularis* tick in the eastern U.S. and *Ixodes pacificus* tick in the western U.S. are commonly termed deer ticks, or black legged ticks, and can carry Lyme disease caused by *Borrelia burgdorferi*. *Borrelia mayonii*, a recently identified bacterium which also causes Lyme disease, is found in *Ixodes scapularis* ticks in the upper Midwest. Anaplasmosis caused by *Anaplasma phagocytophilum* and babesiosis caused by several species of *Babesia* are transmitted by *Ixodes* ticks. Adult *Ixodes* ticks from Michigan are submitted most frequently from late February to late May, then again from late September to early December.

The months of April to August yield the most submissions for *Dermacentor variabilis*, also known as the American dog tick or wood tick; which can carry *Rickettsia rickettsiae*, the cause of Rocky Mountain spotted fever. The summer months are when adult *Amblyomma americanum* ticks (lone star tick) are submitted. Those ticks can carry *Ehrlichia spp*. Finally, *Rhipicephalus sanguineus*, the brown dog tick, which can carry *Babesia spp*, *Ehrlichia spp*, and *Rickettsia spp* is adapted to live indoors and may be submitted any time of the year.

Tick Removal

We recommend that the pet is taken to a veterinarian for tick removal which is best done following the instructions from the Centers for Disease Control: [cdc.gov/ticks/removing_a_tick.html](http://cdc.gov/ticks/removing_a_tick.html) or the American Kennel Club [www.akc.org/content/health/articles/how-to-remove-tick-from-dog/](http://www.akc.org/content/health/articles/how-to-remove-tick-from-dog/). Please remember—be careful when removing a tick. Try to not squish the tick and get blood on yourself (disease producing organisms may be in the blood) and try to keep the head of the tick attached to the body of the tick. An intact head on the tick can aid in identification which is important for determining which diseases are of concern. If the tick cannot be identified at the veterinary clinic, the tick can be sent to the laboratory for identification (test code 60066).

Submitting a Tick for Identification and/or Testing

First, do not squish the tick. Preferably, place the intact tick in a screw top container or empty blood collection tube with a tight fitting stopper. Ticks can escape from a push-and-twist-top pill bottle. Do not place the tick in formalin solution and, please, do not stick the tick to a piece of tape. If the tick is dead and dried out, place it in some saline solution. The tick can be shipped without an ice pack. When the tick is identified, either at the veterinary clinic or at the laboratory, a tick PCR assay (test code 60065) can be done to detect disease-causing organisms that may be borne by the tick.

Overall, of the PCR diagnostics performed at the laboratory, positive results are most likely for *Rickettsia spp*. [Note: A *Rickettsia sp* found in a tick may not be pathogenic for people or animals]. If we detect a *Rickettsia*, we will perform
a PCR assay that is specific for *Rickettsia rickettsii* at no extra charge. The next most common finding is *Babesia odocoilei*, which is known to infect deer and elk, but is not known to cause disease in pets. An increasing number of the PCR assays done at the laboratory for *Borrelia burgdorferi* are positive, as this organism is spreading and becoming more common in the Great Lakes region. We also detect *Anaplasma phagocytophilum* in a few ticks each year and expect this organism to become more common in our area.

**Tick-Borne Diseases in Animals**

Symptoms for tick-borne diseases in animals are typically non-specific and may include fever, weakness, lethargy, lameness, lack of appetite, vomiting, and diarrhea. While much of the veterinary focus on tick-borne diseases tends to be on dogs, remember that many species, including horses, are also susceptible. If a dog, cat, or horse is suspected of having a tick-borne disease, the laboratory offers several tests to aid in diagnosis.

The same PCR assays that are done on ticks to detect the organisms that cause tick-borne disease can be done on a blood sample (purple top, EDTA tube) collected from the pet. Those tests are Anaplasma PCR (90051), Lyme PCR (60059), Babesia spp PCR (60003), Ehrlichia PCR (60048), and Rickettsia PCR (60060). The PCR tests are best done in the acutely affected pet before treatment is started. After treatment is started, or in the chronically affected pet, the preferred tests would be serum based indirect fluorescent antibody (IFA) tests such as the Tick Borne Disease Antibody Screen (60013), which includes all of the tick-borne diseases mentioned here. Tests that can be ordered individually are Anaplasma phagocytophilum IFA (60033), Babesia canis IFA titer (60001), Babesia gibsoni IFA titer (60046), Ehrlichia canis IFA titer (60008), Lyme IFA (60014), and Rickettsia rickettsii IFA (60021). We test about 100 horses each year for Lyme disease and anaplasmosis using the Equine Tick Core Panel, 60989. An antibody titer is reported for all IFA tests. This allows for meaningful comparison of acute and convalescent samples of serum.

We are often asked whether a pet can acquire a tick-borne disease even when a tick has never been found on the animal. Unfortunately, the answer to that question is yes. Remember that the larva and nymph stages of ticks are very small and easily missed when a pet is examined for ticks. Also, we have received several engorged ticks that were not found on the pet, but were found in the house in areas frequented by the pet. So it is possible even for an engorged tick to escape detection on a pet. Prevention, identification, diagnostic testing, and early treatment for infection are keys to decreasing the incidence of severe illness and fatalities.

As always, if you have questions, need help ordering tests, or want more information on testing; call the laboratory. We enjoy the opportunity to talk with our clients!

**For More Information**

In addition to national data provided by the CDC ([http://cdc.gov/ticks](http://cdc.gov/ticks)), look for state and/or local information provided by government agencies such as Community Health/Health and Human Services and Agriculture for information on your specific region.

* sesame seed

Tick photos at left courtesy of Kent Loeffler, Department of Plant Pathology and Plant-Microbe Biology, Cornell University.
A Message from the Director:
Name Change, Accreditation Audit, Laboratory Information Management System Upgrade, Highly Pathogenic Avian Influenza Preparedness, Vector-Borne Diseases

Greetings all, from the faculty and staff of the Michigan State University Veterinary Diagnostic Laboratory! We would like to thank our clients and stakeholders for their input and support as we sought approval for our name change.

This has been an exceptionally exciting and busy time for the laboratory. This spring the laboratory was audited by the AAVLD (American Association of Veterinary Laboratory Diagnosticians). AAVLD is the accrediting body for the laboratory, and the audit is a critical milestone for renewal of our accreditation.

Just after the audit, with special funding from the State of Michigan, the laboratory also updated its laboratory information system, positioning us to make additional changes in the future. While we had hoped that the upgrade would go smoothly, there were a few disruptions to our clients, primarily related to delays in receiving test results. I apologize to all clients who were affected by these disruptions. We remain committed to providing the best service to our clients.

The arrival of spring, the movement of wild birds into the flyways, and the outbreaks of highly pathogenic avian influenza in Asia and Europe prompted the MSU VDL and the Michigan Department of Agriculture and Rural Development to host a joint emergency preparedness workshop. Along with some partners from USDA, we worked together to review logistics, communication, and testing needs should an outbreak occur in Michigan poultry.

Along with the warmer weather, mosquitoes and other insects are making an early appearance. The milder winter this year has led to cases of eastern equine encephalitis being detected in samples sent to the laboratory from the southern U.S. as early as January. We expect that we could see cases of West Nile virus in the Midwest earlier than normal. The Michigan Department of Health and Human Services also reports that while Michigan is still classified as a low incidence state, the number of cases of confirmed Lyme disease has increased. An updated Michigan Lyme Disease Risk Map and other resources for Michigan residents are available online at [http://michigan.gov/emergingdiseases](http://michigan.gov/emergingdiseases). This newsletter provides information on tick borne diseases in animals, how to submit ticks for identification, and available diagnostic options. Along with our public health partners, we encourage everyone to do their part to “Fight the Bite” to protect humans and animals from vector-borne diseases in the coming months.

Well wishes during this time of spring weather, celebrations, and activities,

[signature]