It’s a fungus! It’s a parasite! It’s ... pythium?

*Pythium insidiosum* is an opportunistic, fungal-like, water mold that is found in warm stagnant water with high levels of organic debris (e.g. wetlands, ponds, and swamps). This organism is mostly found in Gulf coast states, but also affects dogs in Oklahoma and surrounding states. *P. insidiosum* is classified as an oomycete. It is similar to a fungus in that it forms mycelia, but differs in cell wall structure and that it does not sporulate. *P. insidiosum* forms zoospores, which have two flagellae that act as tiny propellers so the organism can swim.

*P. insidiosum* can infect dogs, cats, horses, and humans. Although it has not been reported to be contagious, protective wear is recommended when handling suspected cases. There is no reported age or sex predilection in dogs. Clinical signs depend on the route of infection; direct contact with an open wound results in the cutaneous (skin) form and ingestion of infected water results in the intestinal form. Affected dogs are usually febrile. With the cutaneous form, the animal will have a non-healing necrotizing lesion, often associated with pus-filled draining tracts and enlarged lymph nodes (Figure 1). With the intestinal form, animals may vomit, have a long

Figure 1: Dog, skin, lateral abdomen: Cutaneous pythiosis.
Photo courtesy of Dr. Heather Herd.

**Faculty**

*Director:*
Dr. Keith L. Bailey – Pathology

*Assistant Director/Quality Manager:*
Emily J. Cooper

*Bacteriology/Molecular:*
Dr. Akhilesh Ramachandran

*Parasitology:*
Dr. Eileen M. Johnson

*Pathology:*
Dr. Melanie A. Breshears
Dr. Anthony A. Confer
Dr. Grant Rezabek
Dr. Jerry Ritchey
Dr. Tim Snider

*Serology:*
Dr. Grant Rezabek

*Toxicology:*
Dr. Sandra E. Morgan

*Virology:*
Dr. Sanjay Kapil

*Graphic Design/Layout:*
Clarissa Fulton
Pythium continued from page 1

term history of weight loss, and have a thickenod segment of intestine (Figure 2).

Definitive diagnosis of P. insidiosum can be difficult. In biopsy samples, hyphae may be sparse and difficult to visualize on routine H&E stain, requiring the use of special stains such as PAS or GMS. Culture of fresh tissues may also be attempted, but P. insidiosum is a notoriously slow grower (2-3 weeks) that requires additional confirmatory analysis such as polymerase chain reaction (PCR) testing. Treatment is also difficult and of extended duration. Current treatment includes wide surgical excision, antifungals, and immunotherapy, all with variable reports of success. Prevention includes avoiding exposure to open skin wounds and preventing your animal access to potentially infected water sources.

– Dr. Heather Herd

References:

Director’s Note

This edition of the OADDL e-News contains articles relevant to springtime, the time of the year that Charles Dickens so aptly described as summer in the sun and winter in the shade.

Several changes have recently occurred at OADDL in our effort to provide value-added diagnostics and exceptional client services. I would like to thank everyone who participated in our Client Satisfaction Survey earlier this year. We received feedback from clients in 40 Oklahoma counties. The feedback gathered during the survey has already been utilized to shape changes in testing fees. While many of our test fees recently saw minor increases, some of the fees were reduced in response to client feedback.

A major change based on client feedback was package pricing for common bacteriology submissions. The primary objective of this new approach was to provide clients with fixed fees so they can accurately predict testing costs and bill owners accordingly.

OADDL continues to expand diagnostic tests. Based on recent reports of the canine influenza outbreaks in the Midwest, we quickly introduced canine respiratory disease panels in live animals as well as postmortem specimens. Working closely with fellow faculty in the Center for Veterinary Health Sciences we have brought on new diagnostic tests including polymerase chain reaction (PCR) analysis for Ehrlichia species endemic to Oklahoma (i.e. E. canis, E. chaffeensis and E. ewingii) and common pathogens associated with abortions in sheep and goats.

OADDL continues to work closely with the Oklahoma Department of Agriculture, Food and Forestry (ODAFF) to test poultry for avian influenza. We performed 154 PCR tests for avian influenza in the first quarter of 2015. Avian influenza remains a significant threat to Oklahoma poultry.

At OADDL, we are proud to serve you. Your feedback and input is always appreciated. Please contact us at (405) 744-6623 or at www.cvhs.okstate.edu/oaddl.

Dr. Keith L. Bailey
NEW Ehrlichiosis PCR Panel for Dogs

Ehrlichiosis is a tick-borne disease of dogs characterized by acute onset of fever, thrombocytopenia and lymphadenopathy. Within the U.S., Oklahoma and Arkansas have one of the highest incidence of canine infections by multiple Ehrlichia spp. OADDL is offering a PCR panel for detecting E. canis, E. ewingii and E. chaffeensis in whole blood. This PCR protocol was developed and validated for use in clinical specimens in the research laboratory of Dr. Susan Little (Director, National Center for Veterinary Parasitology, OSU)

Test fee: $45.00
Sample type: EDTA blood (1-2 mL)
Turnaround time: 1-2 business days

In addition to direct examination for organisms, OADDL offers several tests in the Serology and Molecular Diagnostics Laboratories which can aid in diagnosis. Several of the molecular tests are recent additions to service at OADDL and are the result of collaboration with Dr. Susan Little and the National Center for Veterinary Parasitology at CVHS.

Dr. G. Rezabek, A. Ramachandran & E. Johnson

Spring Has Sprung! Tick Season Reminders

Following a relatively mild winter, return of some much needed rainfall and spring-time weather patterns it is time for ectoparasite re-emergence from winter dormancy. There are several tick-borne diseases of importance to veterinary patients and OADDL can assist in the diagnosis in many of these cases. Remember, in addition to blood loss anemia, ticks in particular can transmit several rickettsial, ehrlichial and anaplasmosis type infections to both small and large animals. More information on ticks and management is available in a fact sheet jointly produced by Agriculture Extension and the Center for Veterinary Health Sciences (CVHS). [http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-2097/EPP-7001web2014.pdf](http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-2097/EPP-7001web2014.pdf)

Many pathogenic organisms transmitted by ticks are intracellular parasites. Preparation of a fresh blood smear in your clinic is often the most accurate and rapid diagnostic test, and can be point-of-service testing for the client. If you are uncertain about organisms, forward the stained and unstained blood smears to OADDL for interpretation by our Parasitologists. Submitting whole blood (EDTA/Purple Top Tube) is also beneficial however some of these organisms will detach from cells with time and the freshly prepared blood smears are critical in these cases.

In addition to direct examination for organisms, OADDL offers several tests in the Serology and Molecular Diagnostics Laboratories which can aid in diagnosis. Several of the molecular tests are recent additions to service at OADDL and are the result of collaboration with Dr. Susan Little and the National Center for Veterinary Parasitology at CVHS.

<table>
<thead>
<tr>
<th>Direct Exam</th>
<th>Serology Antibody Testing</th>
<th>Polymerase Chain Reaction (PCR)</th>
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<tbody>
<tr>
<td><strong>Cattle</strong></td>
<td></td>
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<tr>
<td>Anaplasma marginale</td>
<td>Anaplasma sp.</td>
<td>Anaplasma marginale</td>
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<tr>
<td>Babesia sp.</td>
<td></td>
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<tr>
<td>Mycoplasma wenyonii</td>
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<tr>
<td><strong>Dogs</strong></td>
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<tr>
<td>Ehrlichia spp.</td>
<td>Ehrlichia canis</td>
<td>Ehrlichia canis</td>
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<tr>
<td>Babesia canis</td>
<td>Ehrlichia ewingii</td>
<td>Ehrlichia chaffeensis</td>
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<tr>
<td>Hepatozoon canis</td>
<td>Borrelia burgdorferi (Lyme)</td>
<td>Babesia canis</td>
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<tr>
<td>Anaplasma phagocytophilum</td>
<td>Anaplasma platys</td>
<td>Babesia canis</td>
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<tr>
<td>Theileria equi</td>
<td>Rickettsia rickettsii (RMSF)</td>
<td>Babesia canis</td>
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<tr>
<td><strong>Cats</strong></td>
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<td>Cytauxzoon felis</td>
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<td>Cytauxzoon felis</td>
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<tr>
<td><strong>Horse</strong></td>
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<tr>
<td>Anaplasma phagocytophilum</td>
<td>Babesia caballi (Piroplasmosis)</td>
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<tr>
<td>Babesia caballi</td>
<td>Babesia equi (Piroplasmosis)</td>
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Seroprevalence to Ehrlichia spp. in dogs in the United States documenting hyperendemic status of Oklahoma and Arkansas (based on Bowman et al., 2009).


Lead Toxicity in Spring Time

Sometimes it seems that broken automobile batteries sprout from the ground in spring just as cattle and other grazers seek new forage growth. Ready access to metallic and compounded lead waste in pastures, dumps, sheds and homes increases the likelihood that large and small animals will consume toxic amounts.

Lead is found in the metallic form as exposed automobile battery plates, expended bullets and shot, fishing weights, old plumbing, roofing nails, and electrical cable shielding. Other common sources are paint from old structures, home renovation waste, caulking, putty, drilling pipe thread compounds, lead arsenate insecticides, soil and mine waste.

Cattle with lead toxicosis may exhibit a range of neurologic symptoms including blindness, head pressing, circling, trembling, depression and death.

Dogs, cats, horses, and avian species may exhibit a wide range of neurologic and gastrointestinal symptoms such as seizures, incoordination, paralysis, depression, anorexia, diarrhea, and anemia. Diagnosis of lead poisoning requires evaluation of symptoms with appropriate laboratory testing.

OADDL offers rapid detection (i.e. same day) of blood lead. The preferred clinical specimen from a live animal is whole blood. Quantitation of liver or kidney lead levels in dead animals can also support the diagnosis of lead toxicosis.

We have seen six (6) positive cases so far this year. All of them have been in April.

– Brent W. Johnson
Toxicology Lab Manager

<table>
<thead>
<tr>
<th>Cases of Lead Toxicosis at OADDL in 2015 (as of April 10, 2015)</th>
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<tbody>
<tr>
<td>Species</td>
</tr>
<tr>
<td>Bald Eagle</td>
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<tr>
<td>Golden Eagle</td>
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<tr>
<td>Bovine (3 month old)</td>
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<tr>
<td>Bovine</td>
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<td>Bovine (1 year old)</td>
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</tbody>
</table>

Getting to Know Us

Zachary Bahm has worked at OADDL as the Necropsy Lab Manager for one year. He grew up in Minot, North Dakota and moved to Oklahoma in 2008 to attain his Bachelors of Science in Animal Science and a Minor in Ag Economics from Oklahoma State University in 2012. Zach and his wife Ashley have a 2 year old son Conway. In his spare time, Zach enjoys spending time with his family, training and showing cutting horses as well as skiing.

Jordan Vickers has worked at OADDL since the middle of 2012 and currently serves as the Necropsy lab technician. He grew up in Hoxie, a small town in NW Kansas. He and his wife Erika have two spoiled dogs Ryleigh and Dezi. They love sports, especially the Dallas Cowboys! Jordan enjoys working in the yard, fishing and working out.

Ideas/Suggestions for Future Content

We want to hear from you. Send your ideas and suggestions to oaddl@okstate.edu.

Contact Us

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