

News from the NCVP

SPRING 2016

SPECIAL POINTS OF INTEREST:

- Virbac joinsNCVP
- New NCVP
 Parasitology
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- Resident updates
- 2015 NCVP Fall Meeting

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PEOPLE



New Industry Sponsor Joins the NCVP!



Dr. Cristiano von Simson, Director of Field Veterinary Services for Virbac Animal Health, and newest NCVP Board

The NCVP is excited to announce the addition of Virbac Animal Health as its newest industry sponsor. Dr. Cristiano von Simson, Director of Field Veterinary Services for Virbac, will serve as the NCVP Virbac sponsor representative. In addition to more than 20 years of experience in the Animal Health Industry, Cristiano is the past Vice-President of the American Heartworm Society, and has lectured at numerous international veterinary and parasitology symposia. The NCVP continues to grow with backing from sponsors, which further supports the mission of the NCVP to meet global challenges in veterinary parasitology and to develop future leaders in the field through our residents. Many thanks to our inaugural and current sponsors for their continued support that has led to the tremendous success that the Center is today.

Way to Go Parasit. Diplomates Adolph, Lee, and Starkey!

NCVP Residents Alice Lee, DVM, PhD Candidate (Novartis) and Lindsay Starkey, DVM, PhD (2015 Bayer resident graduate) and NCVP Zoetis representative Chris Adolph, DVM, MS all took the Parasitology Board Exam in December of 2015...and they can all add "DACVM-Parasitology" to their credentials!



Pictured right, Drs. Alice Lee (right) and Lindsay Starkey (left) together at Wildcat Parasitology training in 2014.

Pictured left, Dr. Chris Adolph, Zoetis Parasitology Specialist and NCVP Board Member.

Drs. Lee, Starkey, and Adolph passed the Parasitology Board Exam in December 2015!



(see page 2 for more information on the recently Boarded Parasitologists of the NCVP)

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People Continued...



Above, an egg of Dipylidium caninum. Dr. Adolph's Master's research entailed evaluating covert infections of shelter cats with adult helminths via collection during necropsy. Interestingly, 40/116 cats were found to harbor adult *D. caninum*, yet all fecal flotations were negative for this parasite.



Above are Toxocara canis adults in the small intestine of a dog. Part of Dr. Alice Lee's PhD research was examining the dynamics of T. canis and Toxoplasma gondii co-infections in mice.

Dr. Chris Adolph graduated with his DVM from Oklahoma State University (OSU) in 1996, then went into small animal practice and became owner of Southpark Veterinary Hospital in Broken Arrow, OK. He earned a Master's Degree in 2013 under the mentorship of NCVP Co-Director **Dr. Susan Little,** Regents Professor and Krull-Ewing Endowed Chair in Veterinary Parasitology at OSU's Center for Veterinary Health Sciences, studying the prevalence of helminths and vector-borne disease agents in cats and comparing fecal parasite egg recovery techniques. Chris switched career paths in 2015 to become a **Parasitology Specialist** for **Zoetis**.

Dr. Lee earned her DVM from Ontario Veterinary College, University of Guelph in 2006 then went into practice for a few years before entering graduate school. She is currently a PhD candidate at Cornell University under **Dr. Dwight Bowman** (Professor of Parasitology and NCVP Board member). Alice defended her dissertational research – less invasive methods to evaluate canine anthelmintic efficacies and the dynamics of *Toxoplasma gondii* and *Toxocara canis* co-infections in mice – on April 15, 2016. She will graduate with her PhD this May. **Go Alice!**

Dr. Starkey graduated with her DVM from OSU in 2011 and began a PhD program under **Dr. Susan Little** to evaluate *Ehrlichia* spp. infections in dogs with regard to canine infection risk, persistence of rickettsemia, and impact on reinfection. She graduated in May 2015 and, in addition to studying for the Board Exam, has been actively engaged in post-doctoral research at OSU. She recently accepted a tenure-track position at Auburn University in Auburn, Alabama (see article below).



First NCVP Bayer Resident, Lindsay Starkey, DVM, now PhD and DACVM-Parasitology, staffs the NCVP table at OSU-CVHS's annual Open House. Lindsay accepted an Assistant Professorship at Auburn University and begins this Nay. Congrats, Lindsay!

Congratulations on the New Position, Lindsay!

First NCVP Bayer Resident Lindsay Starkey, DVM, who graduated with her PhD in May 2015 from Oklahoma State University and passed the Parasitology Board Exam in December 2015 (see above article), recently accepted a position as Assistant Professor of Parasitology in the Department of Pathobiology, College of Veterinary Medicine, at Auburn University (AU) in Auburn, Alabama.

Her new position involves teaching veterinary and graduate students, proposing and conducting scientific research, service to the veterinary community, and outreach efforts to the public. She will be working within the same department as **Dr. Byron Blagburn**, Distinguished Parasitologist at AU and NCVP Academic Board Member. Congratulations, Lindsay! The NCVP is so proud of you and excited about your future!

Updates on NCVP Affiliate Residents



Jennifer Thomas, DVM, NCVP affiliate resident has accepted a Dermatology residency position at **Texas A&M University** in College Station, Texas. Jennifer graduated with her veterinary degree from Oklahoma State University (OSU) in May 2012, and entered a post-doctoral position under Dr.

Mason Reichard, Associate Professor of Parasitology at OSU and NCVP Co-Director. She has worked on several interesting Above: Jennifer Thomas, research projects in parasitology including Trichinella spp. DVM, NCVP affiliate resident infections in wildlife, Ascaris sp. egg destruction in solid waste, ectoparasites on feral cats, and Cytauxzoon felis infections in domestic cats. Jennifer has enjoyed her work in the field of veterinary parasitology, but she has always had a strong commitment to veterinary dermatology and we are so excited in joining this important specialty. success Congratulations, Dr. Thomas!



recently accepted a Dermatology Residency position in the College of Veterinary Medicine at Texas A&M University.

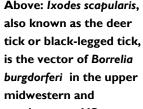


Above: Brian Herrin, DVM, PhD candidate at OSU-CVHS, drags for Ixodes scapularis in Virginia as part of his dissertational research documenting the geographic expansion of ticks harboring Borrelia burgdorferi (causative agent of Lyme disease) southward along the Appalachian Trail.

Dr. Brian Herrin, NCVP Affiliate resident and PhD candidate at Oklahoma State University, has been named the inaugural Boehringer Ingelheim (BI) Postdoctoral Scholar at Oklahoma State University. Funding from the prestigious BI Resident Scholar

program will support Brian as he completes his dissertational research and embarks postdoctoral training while also preparing for board examination veterinary parasitology through the ACVM. Dr. Herrin graduated with his DVM in May 2014 from OSU. He is enrolled in the dual DVM/PhD program at and has been actively engaged in graduate work under the mentorship of NCVP Co-Director **Dr. Susan Little**, Regents Professor and Krull-Ewing Endowed Chair in Veterinary Parasitology at OSU, since his first year of veterinary school. His research focus

Above: Ixodes scapularis, also known as the deer is the vector of Borrelia burgdorferi in the upper midwestern and northeastern US.



is investigating the geographic expansion of **Borrelia** burgdorferi in North America. Way to go, Brian!

EVENTS



The NCVP Goes to NCVP!

You read it correctly! The National Center for Veterinary Parasitology (NCVP) affiliate resident **Dr. Brian Herrin** and Oklahoma State University third-year veterinary student **Livvy Jones** had the opportunity to attend the NCVP meeting in India – the **25th National Congress of Veterinary Parasitology Symposium**, that is.



The meeting, entitled "One Health Approach—Plausible Solution for Sustainable Parasite Control," was held at Tamil Nadu Veterinary and Animal Sciences University (Madras Veterinary College) in Chennai and was sponsored by the Indian Association for the Advancement of Veterinary Parasitology.



Brian (pictured left) presented his work on **geographic expansion of tick-borne diseases** and Livvy presented her findings on **diversity of brown dog ticks** in North America. With travel support from the **Center for Veterinary Health Sciences, Oklahoma State University,** Brian and Livvy were able to attend the **3-day conference**, enjoy tours of the Madras Veterinary College, and interact with parasitologists and other scientists in the region. The exchange was a great success and discussions are already underway to allow other residents and NCVP students to attend similar international conferences in the future.







Above, from left to right: Chalk drawing at conference representing the One-Health approach, Livvy and Brian at a research session with Madras Veterinary College Assistant Professor of Parasitology Dr. P. Azhahianambi ("Dr. Nambi"), and Brian and Livvy at "The Descent of the Ganges" carving on a short site-seeing venture in Mahabalipuram before heading back to the U.S. Many thanks to Madras Veterinary College faculty, graduate students, and conference organizers for their hospitality. Namaste!

A New Space for Diagnostic Parasitology at Oklahoma State!



Above: Clinical Parasitologist Dr. Yoko Nagamori examines a slide under the microscope while technician Abbey Kates prepares fecal flotations in the new Diagnostic Parasitology Lab space at Oklahoma State University.

Above: Clinical Parasitology and clinical research endeavors, as well as foster teaching

The **Diagnostic Parasitology Section** at Oklahoma State
University recently moved to a
much bigger space within the
Oklahoma Animal Disease
Diagnostic Laboratory (OADDL). The
new area is over **three times larger** than the previous lab, which
will allow for additional equipment

and bench space to support increased diagnostic services and clinical research endeavors, as well as foster teaching larger groups of



veterinary and graduate students. **Yoko Nagamori**, DVM, an NCVP resident who will complete her Master's Degree this year, took on the role of **Clinical Veterinary Parasitologist** for the lab in January 2016. **Ms. Abbey Kates** (pictured right) was hired on in January 2016 as the Clinical Parasitology laboratory technician working under Dr. Nagamori.

NCVP Annual Fall 2015 Meeting at Oklahoma State University

The NCVP held their annual **Fall 2015 in-person meeting** at Oklahoma State University (OSU) in Stillwater, OK on **October 27–29**. Pictured right are NCVP Academic and Industry Board members and NCVP residents attending the meeting.

Front row, from left to right: Drs. Yoko Nagamori (Clinical Parasitologist, OSU), Jennifer Thomas (Affiliate resident, OSU), Cassan Pulaski (Merck resident, Louisiana State University), Chris Adolph (Zoetis), Susan Little (NCVP Co-Director, OSU), and Mason Reichard (NCVP Co-Director, OSU). Second row, from left to right: Drs. Doug Carithers (Merial), Jenifer Edmonds (Johnson Research), Kelsey Paras (Elanco resident, University of Georgia), Dan Snyder (Elanco), and Dwight Bowman (Cornell University). Third row, from left to right, Drs. Joe Hostetler (Bayer), Byron Blagburn (Auburn University), Frank Guerino (Merck), and Kelly Allen (NCVP project leader, OSU). Fourth row, from left to right: Drs. Anne Zajac (Virginia Tech), Lindsay Starkey (Bayer resident, 2015 OSU graduate), Alice Lee (Novartis resident, Cornell University), and Jessica Rodriguez (Merial resident, Texas A&M University).





Events continued...

To start off the meeting in style, NCVP Board members and residents played not *too* competitive rounds of mini golf before dinner on the 27th. After dinner, some adventurous members took an evening spin on the lake atop automated paddle boats.

Above: Who is that riding a paddle boat in the middle of a "lake" at a Fun Park?

Why that's Dr. Susan Little, Oklahoma State University Regents Professor, Krull-Ewing Endowed Chair, and NCVP Co-Director. Who says scientists can't have fun???

Pictured left: NCVP residents Drs. Jessica Rodriguez, Cassan Pulaski, and Jennifer Thomas play a round of mini golf with NCVP Board members Drs. Doug Carithers of Merial and Jenifer Edmonds of Johnson Research. The teambuilding exercise kicked off the start of the Annual Fall 2015 NCVP meeting.

Below: NCVP residents with OSU's Pistol Pete. From left to right: : Yoko Nagamori, DVM, MS student (Clinical Parasitologist, OSU), Kelsey Paras, DVM, PhD student (Elanco, UGA), Cassan Pulaski, DVM, MPH, PhD student (Merck, LSU), Pistol Pete!!!, Lindsay Starkey, DVM, PhD, DACVM-Parasitology, (inaugural Bayer resident, OSU), Jessica Rodriguez, DVM, PhD student (Merial, TAMU), Alice Lee, DVM, PhD candidate, DACVM-Parasitology (Novartis, Cornell).

The next day, Board members a n d discussed residents resident progress, existing and potential training programs and short courses, continued AAVP-NCVP collaborations, NCVP research services, and NCVP It was a full day!



NCVP research and Above, Sidney A. Ewing, DVM, MS, PhD, Emeritus Professor of Parasitology (second row, middle) delivered a Keynote presentation to NCVP Board members and Residents, OSU funded grant updates.

It was a full day!

Above, Sidney A. Ewing, DVM, MS, PhD, Emeritus Professor of Parasitology (second row, middle) delivered a Keynote presentation to NCVP Board members and Residents, OSU veterinary students, and several well-known retired parasitologists of OSU during the NCVP Fall 2015 in Stillwater.



Everyone enjoyed dinner that evening over a **Keynote presentation** by **Dr. Sidney Ewing, DVM, MS, PhD, Professor Emeritus at Oklahoma State University** and world renowned parasitologist, who detailed his path to becoming a parasitologist and everyone that he worked with along the way (including Dr. Wendell Krull and 2015 Nobel Prize winner Dr. William Campbell!). Many OSU veterinary students were also in attendance. Even OSU's own **Pistol Pete** made an appearance (in the photo to the left, Pistol Pete and NCVP residents with pistols firing...**Go Pokes**)! (*article continued on the following page...*)



Above, NCVP Elanco representative Dr. Dan Snyder trains NCVP residents on Good Clinical Practice (GCP) during the meeting.

The following day NCVP Board members continued to meet, but residents took advantage of some unique training opportunities. Dr. Dan Snyder (NCVP) Elanco representative) conducted **Good** Practice training and Dr. Susan Little (NCVP Co-Director, OSU), **Dr. Anne Zajac** (NCVP Board Member, Virginia Tech), and **Dr. Joe Hostetler** (NCVP Bayer representative) discussed how to build an effective CV with the residents. Residents then underwent Media **Training** offered by OSU to learn how to speak to the public under Media scrutiny. They then participated in specialized parasitology training sessions offered by several OSU faculty as well as independently held group study sessions to further prepare for the Parasitology Board Exam. For those NCVPers who took the Board Exam in December 2015, those study efforts paid off!

The 2016 Annual Spring NCVP meeting of the Board was held April 12–14 in Stillwater, OK. NCVP Academic Board member Jenifer Edmonds, DVM, PhD, Investigator and Parasitologist at Johnson Research, LLC, delivered a Keynote presentation entitled "CROs – Partners in Science" at Backstage Stillwater to NCVP Board members, local residents, and OSU veterinary students. Further details about the Spring 2016 meeting will be featured in the next NCVP newsletter.

About the National Center for Veterinary Parasitology

Veterinary parasites impact human health and society in many ways. With the generous support of our sponsors, the National Center for Veterinary Parasitology works to promote greater understanding and control of parasitic diseases in animals through innovative partnerships between academia and industry. Housed in the Center for Veterinary Health Sciences at Oklahoma State University, the center strives to create future generations of veterinary parasitologists, conduct targeted research, and provide diagnostic and consulting services worldwide. To learn more, please visit www.ncvetp.org.

















Center for Veterinary Health Sciences
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Selected Publications from NCVP Members

Our residents, faculty, and board members are a busy group. Below is a very abridged list of just a few of the recent publications from NCVP members (names of board members and residents are bolded). To request the full list or individual reprints, please send an email to ncvp@okstate.edu. Most importantly if you have suggestions for future continuing education articles, review papers, or topics you think would be of interest to veterinarians and others in parasitology, please send us your suggestions.

2016 TO DATE ...

Bowman DD, Grazette AR, Basel C, Wang Y, **Hostetler JA**. 2016. Protection of dogs against canine heartworm infection 28 days after four monthly treatments with Advantage Multi® for Dogs. *Parasit Vectors*. 9(1):12.

Rehbein S, Dorr P, **Bowman DD**, Crafford D, Kusi I, Postoli R, Yook S, Chester ST, Dollhofer D, Visser M, Larsen DL. 2016. Efficacy of afoxolaner plus milbemycin oxime chewable tablets against naturally acquired intestinal nematodes in dogs. *Vet Parasitol*. 217:29-35.

Cossaboom CM, Heffron CL, Cao D, Yugo DM, Houk-Miles AE, Lindsay DS, **Zajac AM**, Berke AS, Elvinger F, Meng XJ. 2016. Risk factors and sources of foodborne hepatitis E virus infection in the United States. *J Med Virol*. Feb 17.

Davignon DL, **Lee AC**, Johnston AN, **Bowman DD**, Simpson KW. 2016. Evaluation of capsule endoscopy to detect mucosal lesions associated with gastrointestinal bleeding in dogs. *J Small Anim Prac*. 57(3):148-58.

Breitschwerdt E, **Little S**, Rugg D. 2016. Sarolaner – a novel isoxazolineaddresses the need for enhanced flea and tick control. *Vet Parasitol*. Mar 5.

Raghavan RK, Goodin DG, Hanzlicek GA, Zolnerowich G, **Dryden MW**, Anderson GA, Ganta RR. Maximum entropy-based ecological niche model and bio-climatic determinants of lone star tick (*Amblyomma americanum*) niche. *Vector Borne Zoonotic Dis*. 16(3):205-11.

Horowitz IH, Dubielzig RR, Botero-Anug AM, Lucio-Forster A, **Bowman DD**, Rosenzweig AB, Frenkel S, Ofri R. 2016. Conjunctival habronemiasis in a square-lipped rhinoceros (*Ceratotherium simum*). *Vet Ophthalmol*. 19(2):161-6.

McMahan CS, Wang D, Beall MJ, **Bowman DD**, **Little SE**, Pithua PO, Sharp JL, Stich RW, Yabsley MJ, Lund RB. 2016. Factors associated with *Anaplasma* spp. seroprevalence among dogs in the United States. *Parasit Vectors*. 9(1):169.

Rodriguez JY, Camp JW, Lenz SD, Kazacos KR, Snowden KF. 2016. Identfication of *Heterobilharzia americana* infection in a dog residing in Indiana with no history of travel. J Am Vet Med Assoc. 248(7):827-30.

Ketzis JK, Fogarty EA, Marttini K, **Bowman DD**. 2016. Explaining premonition with Kin selection using *Haemonchus contortus*. *Parasitology*. Apr. 5.

Blagburn BL, Arther RG, Dillon AR, Butler JM, Bowles JV, **von Simson C**, Solynas R. 2016. Efficacy of four commercially available heartworm preventive products against the JYD-34 laboratory strain of *Dirofilaria immitis*. *Parasit Vectors*. 9(1):191.

HIGHLIGHTS FROM 2015...

Little S, Adolph C, Downie K, Snider T, **Reichard M**. 2015. High prevalence of covert infection with gastrointestinal helminths in cats. *J Am Anim Hosp Assoc*. 51(5):359-64.

Bowman D, Charles SD, Arther RG, Settje T. 2015. Laboratory evaluation of 10% imidacloprid + 2.5% moxidectin topical solution (Advantage® Multi, Advocate®) for the treatment of *Dirofilaria immitis* circulating microfilariae in dogs. *Parasitol Res.* 114 Suppl 1:S165-74.

Lee AC, Epe C, **Bowman DD**. 2015. Determination of anthelmintic efficacy against *Toxocara canis* in dogs by use of capsule endoscopy. *Vet Parasitol*. 212(3 -4):227-31.

Hackworth CE, Eshar D, Lindemann DM, **Dryden MW**. CLINICAL CHALLENGE. Diagnosis: *Mesocestoides* spp. 2015. *J Zoo Wildl Med*. 46(3):657-9.

Ohmes CM, **Hostetler J**, Davis WL, Settje T, McMinn A, Everett WR. 2015. Comparative efficacy of an imidacloprid/flumethrin collar (Seresto®) and an oral fluralaner chewable tablet (Bravecto®) against tick (*Dermacentor variabilis* and *Amblyomma americanum*) infestations on dogs: a randomized controlled trial. *Parasitol Res.* 114 Suppl 1:S95-108.

Ohmes CM, **Hostetler J**, Davis WL, Settje T, Everett WR. 2015. Comparative efficacy of an imidacloprid/flumethrin collar (Seresto[®]) and an oral afoxolaner chewable (NexGard®) against tick (*Dermacentor variabilis* and *Amblyomma americanum*) infestations on dogs: a randomized controlled trial. *Parasitol Res.* 114 Suppl 1:S81-94.

Rust MK, Vetter R, Denholm I, **Blagburn B**, Williamson MS, Kopp S, Coleman G, **Hostetler J**, Davis W, Mencke N, Rees R, Foit S, Böhm C, Tetzner K. 2015. Susceptibility of adult cat fleas (Siphonaptera: Pulicidae) to insecticides and status of insecticide resistance mutations at the rdl and knockdown resistance loci. *Parasitol Res.* 114 Suppl 1:S7-18.

Dryden MW, Smith V, Bennett T, Math L, Kallman J, Heaney K, Sun F. Efficacy of fluralaner flavored chews (Bravecto) administered to dogs against the adult cat flea, *Ctenocephalides felis felis* and egg production. 2015. *Parasit Vectors* 8:364. Erratum in *Parasit Vectors* 8:405.

Carithers D, Everett WR, Gross SJ, Solanki R. 2015. Efficacy of a proprietary formulation of fipronil/(S)-methoprene/cyphenothrin against *Ixodes scapularis* tick infestations on dogs. *Parasit Vectors*. 8:379.

Dryden MW, Smith V, Chwala M, Jones E, Crevoiserat L, McGrady JC, Foley KM, Patton PR, Hawkins A, **Carithers D**. 2015. Evaluation of afoxolaner chewables to control flea populations in naturally infested dogs in private residences in Tampa FL, USA. *Parasit Vectors*. 8:286.

Hayes B, Schnitzler B, Wiseman S, **Snyder DE**. 2015. Field evaluation of the efficacy and safety of a combination of spinosad and milbemycin oxime in the treatment and prevention of naturally acquired flea infestations and treatment of intestinal nematode infections in dogs in Europe. *Vet Parasitol*. 207(1-2):99-106.

Reichard MV, Criffield M, **Thomas JE**, Paritte JM, Cunningham M, Onorato D, Logan K, Interisano M, Marucci G, Pozio E. 2015. High prevalence of *Trichinella pseudospiralis* in Florida panthers (*Puma concolor coryi*). *Parasit Vectors*. 8:67.

Rizzi TE, **Reichard MV**, Cohn LA, Birkenheuer AJ, Taylor JD, Meinkoth JH. 2015. Prevalence of *Cytauxzoon felis* infection in healthy cats from enzootic areas in Arkansas, Missouri, and Oklahoma. *Parasit Vectors*. 8(1):13.

Varloud M, Fourie JJ, **Blagburn BL**, Deflandre A. 2015. Expellency, anti-feeding and speed of kill of a dinotefuran-permethrin-pyriproxyfen spot-on in dogs weekly challenged with adult fleas (*Ctenocephalides felis*) for 1 month-comparison to a spinosad tablet. *Parasitol Res.* 114(7):2649-57.

Rosypal AC, Houk AE, **Zajac AM**, Lindsay DS. 2015. Prevalence of IgG antibodies to *Toxoplasma gondii* in veterinary and undergraduate students at Virginia Tech, Blacksburg, Virginia. *Zoonoses Public Health*. 62(7):553-6.

Bowdridge SA, **Zajac AM**, Notter DR. 2015. St. Croix sheep produce a rapid and greater cellular immune response contributing to reduced establishment of *Haemonchus contortus*. *Vet Parasitol*. 208(3-4):204-10.

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Otranto D, Giannelli A, Latrofa MS, Dantas-Torres F, Trumble NS, Chavkin M, Kennard G, Eberhard ML, **Bowman DD**. 2015. Canine Infections with *Onchocerca lupi* Nematodes, United States, 2011-2014. *Emerg Infect Dis*. 21(5):868-71.

Herd HR, Sula MM, **Starkey LA**, Panciera RJ, **Johnson EM**, Snider TA, Holbrook TC. 2015. *Sarcosystis fayeri*-induced granulomatous and eosinophilic myositis in two related horses. *Vet Pathol*. 52(6):1191-4.

Paddock CD, Dension AM, **Dryden MW**, Noden BH, Lash RR, Abdelghani SS, Evans A, Ganta RR, **Little SE**. 2015. High prevalence of "Candidatus Rickettsia andeanae" and apparent exclusion of *Rickettsia parkeri* in adult *Amblyomma maculatum* (Acari: Ixodidae) from Kansas and Oklahoma. *J Med Entomol*. 6(3):297-302.

Little SE, **Hostetler JA**, **Thomas JE**, Bailey KL, Barrett AW, Gruntmeir K, Gruntmeir J, **Starkey LA**, **Blagburn BL**. 2015. Moxidectin steady state prior to inoculation protects cats from subsequent, repeated infection with *Dirofilaria immitis*. *Parasit Vectors*. 8:107.

Starkey LA, Barrett AW, Beall MJ, Chandrashekar R, Thatcher B, Tyrrell P, **Little SE**. 2015. Persistent *Ehrlichia ewingii* infection in dogs. *JVIM*. 29(2):552-5.

Barrett AW, Noden BH, Gruntmeir JM, Holland T, Mitcham JR, Martin JW, **Johnson EM**, **Little SE**. 2015. County scale distribution of *Amblyomma americanum* in Oklahoma: addressing local deficits in tick maps based on passive reporting. *J Med Entomol*. 52(2):269-73.

Drake J, Gruntmeir J, Merritt H, **Allen L, Little SE**. 2015. False negative antigen tests in dogs infected with heartworm and placed on macrocyclic lactone preventives. *Parasit Vectors*. 8:68.