

# News from the NCVP

DECEMBER 2016

# SPECIAL POINTS OF INTEREST:

- Zajac named
   Distinguished
   Veterinary
   Parasitologist
- 2016 Resident updates
- NCVP at AAVP in San Antonio

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• 2016 NCVP Fall meeting

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## **Awards and Accolades**

## Dr. Zajac Named Distinguished Veterinary Parasitologist



Anne Zajac, MS, DVM, PhD, DACVM-Parasitology received **AAVP-Merial** the Annual Distinguished Veterinary **Parasitologist** Award at this year's **AAVP** meeting. Congratulations, Anne, on this well-deserved honor! Dr. Zajac received her BS from the University of Michigan, her MS and DVM from Michigan State University, and her PhD in veterinary parasitology from The Ohio State University. She is currently a Professor of Parasitology in the Biomedical Sciences and Pathobiology Department at Virginia-Maryland College of Veterinary Medicine, Virginia Tech in Virginia, Blacksburg, where she teaches parasitology to undergraduate, graduate, and veterinary students. In addition, she heads a clinical parasitology research program at

**Virginia Tech** which focuses on gastrointestinal nematodes of ruminants and intestinal protozoa of dogs and cats.

**Dr. Zajac is internationally recognized** for her expertise in clinical parasitology. She is co-author of <u>Veterinary Clinical Parasitology</u>, the textbook now in its eighth edition used to train veterinary students and technicians in diagnostic parasitology. She received the Distinguished Service Award from the AAVP in 2008. She has served as past-president of the AAVP and is a **Charter Diplomate in Parasitology** through the ACVM. The NCVP is so honored to have Dr. Zajac as an academic advisory board



member! Pictured above: Haemonchus contortus larvae suspended in a water droplet. Dr. Anne Zajac, 2016 Distinguished Parasitologist, is well known for her work on ruminant gastrointestinal nematodes.





sitology at Oklahoma State



Dr. Jessica Rodriguez (and best friend), Merial Resident in veterinary parasitology at Texas A&M University.



### **NCVP** Resident Annual Activities and Achievements

Our residents have been hard at work honing their skills in veterinary clinical parasitology and sharing their growing expertise with the profession. Check out just a few of the things that have been keeping them busy over the past year.

#### Dr. Brian Herrin, Oklahoma State University

**Dr. Brian Herrin**, the first **BI** Resident Scholar in veterinary parasitology, successfully defended his PhD dissertation entitled "Geographic distribution of Lyme borreliosis in North America" in July





Above are individual cells of Borrelia burgdorferi, the spirochete causing Lyme Disease in humans and dogs in endemic areas of North doctoral research has documented the expanscapularis) in the eastern United States.

2016. That same month he received the 2016 AAVP-CAPC Award for Graduate Student Research in Zoonotic Diseases. Although busy presenting his research at national and international conferences and mentoring veterinary student researchers in the lab, Brian has managed to find time to secure intramural and extramural funding for his post-doctoral research. took the board examination in parasitology through the American America. Dr. Herrin's dissertational and post- College of Veterinary Microbiology (ACVM) in December 2016. He is sion of B. burgdorferi-infected ticks (Ixodes Currently applying for positions in academia. Good luck in your future endeavors, Brian!

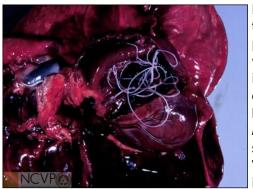
#### Dr. Jessica Rodriguez, Texas A&M University

Dr. Jessica Rodriguez, the Merial Resident in Veterinary Parasitology at Texas A & M University, is currently writing her graduate research dissertation. Along the way she has also managed to publish a case report in JAVMA documenting



Heterobilharzia in Indiana for the first time, secure intramural and extramural grant funds to support her travel and her research, and even attended a CAPC board meeting as a guest parasitologist. Not surprisingly, her many successful efforts were recognized in 2016 with two awards from Texas A&M's College of Veterinary Medicine: the High Impact Achievement Award for a Small Grant and the Outstanding PhD Student Award. Way to go, Jessica!

#### Dr. Cassan Pulaski, Louisiana State University



Above: Adults of Dirofilaria immitis, the canine heartworm, recovered from the pulmonary artery of a dog at necropsy. Dr. Cassan renowned Biology Pulaski's residency research focuses on heart- COURSE at the worm resistance to macrocyclic lactones.

Dr. Cassan Pulaski, LOUISIANA STATE UNIVERSIT the **Merck** Resident in veterinary parasitology, has had a busy year as well. In addition to delivering several invited presentations on her cuttingresearch into macrocyclic edge lactone resistance in Dirofilaria immitis, Cassan (pictured right) spent several months at the FDA's Center for Veterinary Medicine as a visiting scholar investigating lack of efficacy claims for heartworm preventives. In the summer of 2016 she attended the internationally **Parasitism** Marine Laboratory Woods Massachusetts. Cassan was also

recognized for excellence in teaching at LSU with the **Dean's Teacher Merit** Honor Roll. The students (and we!) are lucky to have you in parasitology, Cassan!





#### Dr. Kelsey Paras, University of Georgia



Above: Dr. Kelsey Paras (and 4legged friend) is the Elanco Resithe University of Georgia.



**Kelsey Paras**, the **Elanco** Resident in veterinary parasitology, was extremely productive in her first year in the program. She presented her initial research findings comparing fecal egg counting methods across different livestock species at both the AAVP and at a specialist anthelmintic resistance conference in San Diego. In addition, Kelsey immersed herself in teaching and diagnostic service this past year, serving as both a teaching assistant for the veterinary parasitology courses and performing diagnostic tests for the clinical parasitology laboratory at UGA. She also shared her veterinary parasitology expertise with producers,

dent in veterinary parasitology at providing educational presentations on parasite control to the Florida Cattlemen's Association and at a FAMACHA workshop in

> Pictured right: A sheep with "bottle jaw", a sign of hypoprotienemia caused by anemia from Haemonchus contortus infection. Dr. Kelsey Paras has a research interest in the strategic management of important parasites in food animal medicine.

#### New Resident Dr. Ashley Steuer, University of Kentucky



Above: Dr. Ashley Steuer, inaugural Zoetis Resident.

**Dr. Ashley Steuer**, the **Zoetis** Resident in veterinary parasitology, graduated with her DVM from the University of Tennessee's College of Veterinary Medicine in May 2016 and

started on her PhD and residency training under the direction of Dr. Martin Nielsen at the University of Kentucky. Originally from Kalamazoo, Michigan, Ashley (pictured left) is enjoying the transition to Lexington and to full-time veterinary parasitology. At the Gluck Center, she plans to focus her research on using classical and molecular techniques to better understand epidemiology and control of equine parasites while also undertaking

advanced training in diagnosing the broad expanse of veterinary parasites as she prepares for the

board examination.

Welcome Ashley! We can't wait to see

Pictured right: A larvated strongyle egg in a fecal flotation from a horse. Dr. Ashley Steuer's research will focus on equine parasite epidemiology and control.



# MALS. FOR HEALTH. FOR YOU.™ what's next!

### NCVP Resident Alumni, Drs. Alice Lee and Lindsay Starkey



Congratulations Alice Lee, DVM, PhD, DACVM-Parasitology, the inaugural NCVP Novartis Resident who graduated from the PhD program at Cornell University College of Veterinary Medicine under the mentorship of Dwight Bowman, Professor of Parasitology, in August 2016. Alice is currently serving as an Extension Associate at Cornell University. She is continuing her

capsule endoscopy research and has helped to launch the Master of Professional Studies degree in veterinary parasitology now offered by Cornell. Pictured left: PhD graduate Alice Lee, DVM and PhD mentor Dwight Bowman on graduation day at Cornell.

Lindsay Starkey, DVM, PhD, DACVM-Parasitology, the inaugural NCVP Bayer Resident who graduated with her PhD under the mentorship of Susan Little, Regents Professor at the Oklahoma State University Center for Veterinary Health Sciences, in May 2015 has been hard at work at Auburn University. She accepted an Assistant Professorship in the Department of Pathobiology at AU in the Spring of 2016. In July she began setting up her lab, conducting research, and preparing to be an instructor in veterinary parasitology.



Above: Assistant Professor Dr. Lindsay Starkey lectures to Auburn University veterinary students in Parasitology.

## **Events**



### NCVP at AAVP 2016 in San Antonio, Texas

Pre-AAVP Luncheon with Residents, Mentors, and Board Members

This year the **NCVP pre-AAVP luncheon** was held on the River Walk in **San Antonio, Texas** at the Iron Cactus. Residents, Resident mentors, industry sponsor representatives, and academic board members enjoyed catching-up over Tex-Mex and margaritas.



It was a delightful way to kick-start the 61st annual AAVP meeting!

#### NCVP Research Presentations at AAVP 2016



#### **NCVP Residents:**

**Alice Lee, DVM, PhD, DACVM-Parasit.** (Cornell University College of Veterinary Medicine, NCVP Resident Alumna, Novartis)—In vivo quantification of *Dipylidium caninum* and *Toxascaris leonina* in experimentally infected dogs.

**Kelsey Paras, DVM, PhD Student** (University of Georgia College of Veterinary Medicine, Elanco Resident)—Comparison of fecal egg counting methods in four livestock species.

**Jessica Rodriguez, DVM, PhD Student** (Texas A&M University College of Veterinary Medicine and Biomedical Sciences, Merial Resident)—Do as the humans do: Detecting circulating antigens in dogs infected with *Heterobilharzia americana*.

**Cassan Pulaski, DVM, PhD Student** (Louisiana State University School of Veterinary Medicine, Merck Resident):

- Macrocyclic lactone resistance in *Dirofilaria immitis*: The next phase in understanding this complex and *still* contentious issue. *President's Symposium*.
- The potential use of levamisole in a macrocyclic lactone resistance management strategy in *Dirofilaria immitis* infections.

NCVP Residents Drs. Brian Herrin, Cassan Pulaski, and Jessica Rodriguez also presented at AVMA 2016. See presentation titles below:

- **Dr. Brian Herrin**—Equine ectoparasites and vector-borne diseases.
- **Dr. Cassan Pulaski**—All in the family: Companion animals and parasitic zoonosis.
- **Dr. Jessica Rodriguez** What parasites have I been missing?





Above: Dr. Anne Zajac accepting the prestigious 2016 AAVP-**Merial Distinguished Veterinary** Parasitologist Award presented to her by AAVP Secretary/ Treasurer Dr. Doug Carithers of Merial (right) and AAVP Awards Chair Dr. Tom McTier of Zoetis (left).



Above: Egg of Hymenolepis dimunata, the rodent tapeworm. Dr. Anne Zajac, 2016 Distinguished Veterinary Parasitologist, first discovered her love for parasitology while working on this parasite. During Dr. Zajac's Keynote presentation at AAVP she spoke of the long travel necessary to interview with Dr. Adrian Hopkins at the Wellcome Laboratories for Experimental Parasitology, University of Glasgow. Anne jokingly explained that she believed that the main reason for her good fortune of being hired by Dr. Hopkins was simply because "she showed up." Well, fortunate for all of us, Anne!



#### NCVP Research Presentations at AAVP 2017 Continued...

#### **NCVP Board Members:**

Dwight Bowman, MS, PhD, DACVM-Parasit. (Hon.) (Cornell University College of Veterinary Medicine)

- Examination of the "susceptibility gap" in the treatment of patent canine heartworm infections.
- The misplaced risk of macrocyclic lactones in heartworm infected dogs.
- Prevention of canine heartworm disease and infection all month long with Advantage Multi® for dogs.

Byron Blagburn, MS, PhD, DACVM-Parasit. (Hon.) (Auburn University College of Veterinary Medicine)—Who's who and where: Prevalence of Ctenocephalides felis felis and Ctenocephalides canis in shelter dogs and cats in the United States.

Michael Dryden, DVM, MS, PhD, DACVM-Parasit. (Kansas State University College of Veterinary Medicine)—Evaluation of fluralaner and afoxolaner treatments to control flea populations, reduce pruritus and minimize dermatologic lesions in naturally infested dogs in private residences in west central FL, USA.

Mason Reichard, MS, PhD (Oklahoma State University Center for Veterinary Health Sciences)—Timing of Cytauxzoon felis transmission by Amblyomma americanum to domestic cats in relation to duration of infestation and investigation of oral ingestion of infected ticks as a potential route of transmission.

Daniel Snyder, DVM, PhD, DACVM-Parasit. (Elanco)—The safety of milbemycin oxime after administration to heartworm positive microfilaremic dogs.

Anne Zajac, MS, DVM, PhD, DACVM-Parasit. (Virginia-Maryland College of Veterinary Medicine at Virginia Tech)—2016 AAVP-Merial **Distinguished Parasitologist Presentation.** See front page.

#### NCVP Educational Table Popular Again at AAVP 2016

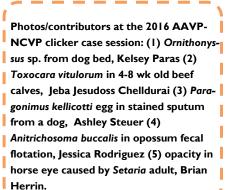
The table at AAVP 2016 was again stocked with NCVP newsletters, brochures, Resident and research grant applications, and of course, various "swaq." Back by popular demand were new temporary tattoos and new parasite videos on NCVP-branded jump drives. No parasitestamped M&Ms this year, but NCVP-branded water bottles and fecal pick-up bag dispensers shaped like miniature fire hydrants went flying of the table. Thanks to everyone who stopped by the table to learn more about the mission of the NCVP!

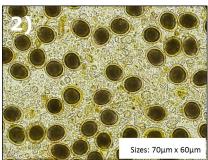
#### NCVP Residents Host NCVP-AAVP Clicker Session

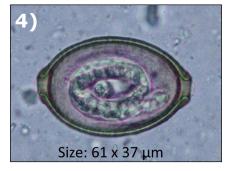


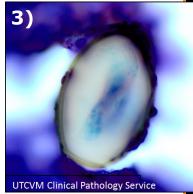
Many thanks to the AAVP for hosting the interactive clinical case series as an entertaining (yet educational) close to the AAVP meeting in San Antonio, Texas. Once again, Master of Ceremonies, Dr. Andrew Peregrine (Associate Professor of Parasitology at the University of Guelph, Ontario, Canada), kept the session on task while providing comic relief. NCVP Residents Drs. Brian Herrin (Oklahoma State University, BI Scholar), Kelsey Paras (University of Georgia, Elanco), Jessica Rodriguez (Texas A&M, Merial) and AAVP student member Jeba Jesudoss Chelladurai (Iowa State University) each presented clinical cases for audience participation. Photos from some of these cases are shown below. Great job, guys! And, thanks to all of those who attended!













### Fall 2016 NCVP Meeting in Stillwater, OK

The **2016** NCVP meeting of the Board and Residents took place in Stillwater, OK on October 4–6, 2016. Board members, Residents, and Oklahoma State University veterinary students with an interest in parasitology enjoyed a presentation entitled "Chemical exchanges between heartworms and hosts: New insights" at *Backstage Stillwater* by invited Keynote speaker Dr. Tim Geary (pictured right), Canada Research Chair in Parasite Biotechnology (Institute Director) at McGill University in Montreal, Quebec, Canada.



### Events continued...

During the meeting, individual NCVP Residents provided updates on their training progress, and Board discussed 2016 NCVP accomplishments, future goals, and 2016 grant applications. the meeting the Residents independently convened to discuss study for the **ACVM** board strategies examination in parasitology, a discussion led by Brian Herrin, DVM, PhD, NCVP Resident Scholar (BI), who sat for the this December. Pictured right: Invited Keynote speaker Dr. Tim Geary (top of stairs-where is your Hawaiian shirt, Tim?) with NCVPers and OSU veterinary students after his presentation over dinner at Backstage Stillwater.



Pictured left: After the 2016 NCVP Annual Fall in-person meeting, NCVP Residents independently convened to share study strategies and preparation approaches for the board examination in parasitology offered by the ACVM. From left to right are Residents Jessica Rodriguez (TAMU, Merial), Kelsey Paras (UGA, Elanco), Brian Herrin (OSU, BI Scholar), Ashley Steuer (UK, Zoetis), and Cassan Pulaski (LSU, Merck). Dr. Herrin, who graduated in August 2016, sat for the board exam in parasitology this December.

### Research





### **NCVP Funded Research Projects**

In Fall of 2015, the NCVP awarded research grants to 9 members of the American Association of Veterinary Parasitologists (AAVP) from across the US and Canada. The NCVP Grants Program was established to provide a mechanism to obtain research funds for parasites that are less eligible for funding through traditional channels. Projects funded for research in 2016 focused on *Dirofilaria immitis*, *Echinococcus multilocularis*, *Haemonchus contortus*, *Heterobilharzia americana*, *Parelaphostrongylus tenuis*, *Onchocerca lupi*, and parasites of marine mammals. We are pleased to announce that the NCVP, again in cooperation with the American Heartworm Society, funded another round of grants this Fall. Stay tuned for 2017 NCVP-funded research progress updates!

### 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 <a href="https://www.ncvetp.org">www.ncvetp.org</a>.

















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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 <a href="mailto:ncvp@okstate.edu">ncvp@okstate.edu</a>. 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 ...

Rosypal AC, Houk-Miles A, **Zajac AM**, Lindsay DS. Nov 2016. Flotation of *Toxocara canis* eggs in commercial bleach and effects of bleach treatment times on larval development in these eggs. *J Parasitol*. [Epub ahead of print].

Snowden KF, Krecek RC, **Bowman DD**. Winter 2016. AAVP recommendations for core competency standards relating to parasitological knowledge and skills. *J Vet Med Educ*. 43(4):344-348.

**Bowman DD,** Liu Y, McMahan CS, Nordone SK, Yabsley MJ, Lund RB. Oct 2016. Forecasting United States heartworm *Dirofilaria immitis* prevalence in dogs. *Parasit Vectors*. 9(1):540.

Gruntmeir JM, Adolph CB, Thomas JE, Reichard MV, Blagburn BL, Little SE. Sep 2016. Increased detection of *Dirofilaria immitis* antigen in cats after heat pretreatment of samples. *J Feline Med Surg*. [Epub ahead of print]

Saleh MN, Gilley AD, Byrnes MK, **Zajac AM**. Sep 2016. Development and evaluation of a protocol for control of *Giardia duodenalis* in a colony of group-housed dogs at a veterinary medical college. *J Am Vet Med Assoc.* 249(6):644-9.

Raghavan RK, Goodin DG, Hanzlicek GA, Zolnerowich G, **Dryden MW**, Anderson GA, Ganta RR. Sep 2016. Maximum entropybased ecological niche model and bio-climatic determinants of lone star tick (*Amblyomma americanum*) niche. *Vector Borne Zoonotic Dis*. 16(3):205-11.

**Thomas JE**, Staubus L, Goolsby JL, **Reichard MV**. Sep 2016. Ectoparasites of free-roaming domestic cats in the central United States. *Vet Parasitol*. 228:17-22.

Mani T, Bourguinat C, Keller K, Ashraf S, **Blagburn B**, Prichard RK. Sep 2016. Interaction of macrocyclic lactones with a *Dirofilaria immitis* P-glycoprotein. *Int J Parasitol*. 46(10):631-40.

Ketzis JK, Fogarty EA, Marttini K, **Bowman DD**. Aug 2016. Explaining premonition with Kin selection using *Haemonchus contortus*. *Parasitology*. 143(9):1187-92.

Fankhauser R, Hamel D, Dorr P, **Reinemeyer CR**, Crafford D, **Bowman DD**, Ulrich M, Yoon S, Larsen DL. Jul 2016. Efficacy of oral afoxolaner plus milbemycin oxime chewables against induced gastrointestinal nematode infections in dogs. *Vet Parasitol*. 225:117-22.

**Starkey LA**, Newton K, Brunker J, Crowdis K. Edourad EJ, Meneus P, **Little SE**. Jul 2016. Prevalence of vector-borne pathogens in dogs from Haiti. *Vet Parasitol*. 224:7-12.

Shreeg ME, Marr HS, Griffith EH, Tarigo JL, Bird DM, **Reichard MV**, Cohn LA, Levy MG, Birkenheuer AJ. Jul 2016. PCR amplification of a multi-copy mitochondrial gene (cox3) improves detection of *Cytauxzoon felis* infection as compared to a ribosomal gene (18S). *Vet Parasitol*. 225:123-30.

**Dryden MW**, Canfield MS, Kalosy K, Smith A, Crevoiserat L, McGrady JC, Foley KM, Green K, Tebaldi C, Smith V, Bennett T, Heaney K, Math L, Royal C, Sun F. Jun 2016. Evaluation of flualaner and afoxolaner treatments to control flea populations, reduce pruritis and minimize dermatologic lesions in naturally infested dogs in private residences in west central Florida USA. Parasit Vectors. 9(1):365.

Milley C, **Dryden M**, Rosenkrantz W, Griffin J, Reeder C. Jun 2016. Comparison of parasitic mite retrieval methods in a population of community cats. *J Feline Med Surg*. [Epub ahead of print].

**Dryden MW**, Smith V, Davis WL, Settje T, **Hostetler J**. May 2016. Evaluation and comparison of a flumethrin-imidacloprid collar and repeated monthly treatments of fipronil/(s)-methoprene to control flea, *Ctenocephalides f. felis*, infestations on cats for eight months. *Parasit Vectors*. 19(1):287.

Barrett AW, **Little SE**. Jun 2016. Vector-borne infections in tornadodisplaced and owner-relinquished dogs in Oklahoma, USA. *Vector Borne Zoonotic Dis*. 16(6):428-30.

Breitschwerdt E, **Little S**, Rugg D. May 2016. Sarolaner – a novel isoxazoline-addresses the need for enhanced flea and tick control. *Vet Parasitol*. 222:1-2.

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

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

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

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

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

Cossaboom CM, Heffron CL, Cao D, Yugo DM, Houk-Miles AE, Lindsay DS, **Zajac AM**, Berke AS, Elvinger F, Meng XJ. Feb 2016. Risk factors and sources of foodborne hepatitis E virus infection in the United States. *J Med Virol*. 88(9):1641-5.

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

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

