

SCIENTIFIC PROGRAM



SATURDAY, SEPTEMBER 7

4:00 - 8:00 PM Registration / Check-in

Maison Foyer

SUNDAY, SEPTEMBER 8

7:00 AM Breakfast

Canal St. Foyer

7:45 Welcome / Introductions / Announcements *Dr. Chris Rehm* Grand Ballroom
Heartworm Life Cycle Video Preview

TIME	SESSION / TITLE	SPEAKER	LOCATION
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8:00-9:35 AM Session 1: Epidemiology and Prevalence of *D. immitis* • Moderator: Rehm

8:00-9:00 Overview on canine dirofilariosis in the Americas, with notes on other filarial worms infecting dogs *Dr. Filipe Dantas-Torres* Grand Ballroom

9:00-9:35 The prevalence of *Dirofilaria immitis* and *D. repens* in the Old World *Dr. Claudio Genchi* Grand Ballroom

9:35 - 10:00 AM Break

Foyer

10:00 AM - 12:30 PM Session 2: Mosquito Vectors • Moderator: Duke

This session is sponsored by Ceva



10:00-10:30 Effect of 2016 severe flooding on prevalence of *D. immitis* infection in dogs in Baton Rouge, Louisiana *Dr. Clarke Atkins* Grand Ballroom

10:30-10:55 Potential mosquito vectors of *Dirofilaria immitis* from residential entryways *Dr. Tanja McKay* Grand Ballroom

10:55-11:20 Anti-feeding and insecticidal efficacy of Vectra 3D® (dinotefuran, permethrin, pyriproxyfen) in dogs against *Aedes aegypti* mosquitoes over 8 weeks *Dr. Marie Varloud* Grand Ballroom

11:20-11:45 Do *Dirofilaria immitis* infections in *Aedes aegypti* affect wing beat frequencies? *Doyeon Park* Grand Ballroom

11:45-12:05 Resistance is futile: Activation of the *Aedes aegypti* mosquito toll immune signaling pathway blocks development of transmission-stage *Dirofilaria immitis* *Dr. Michael Povelones* Grand Ballroom

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TIME	SESSION / TITLE	SPEAKER	LOCATION
12:05-12:30	Do canids infected with <i>Dirofilaria immitis</i> release unique volatile organic compounds in their breath?	<i>Dr. Sarah Zohdy</i>	Grand Ballroom
12:30-2:00 PM	LUNCH - Meet the Professors Heartworm Conundrums and Solutions: Your Questions Answered – Part One	<i>Dr. Clarke Atkins Dr. Marisa Ames</i>	
2:00-3:00	Microclimates and the mosquito as the required vector for transmission of <i>Dirofilaria immitis</i>	<i>Dr. Tanja McKay, Dr. Stephen Jones</i>	Grand Ballroom
3:00 PM	Open Time - Free Afternoon		
7:30-9:30 PM	Opening Reception sponsored by Boehringer-Ingelheim		Grand Ballroom

MONDAY, SEPTEMBER 9

7:00 AM	Breakfast		Canal St. Foyer
7:45	Welcome / Introductions / Announcements	<i>Dr. Chris Rehm</i>	Grand Ballroom

8:00-10:00 AM Session 3: Prevention • Moderator: Payne

This session is sponsored by Zoetis



8:00-8:25	The efficacy of topical formulations of selamectin plus sarolaner in preventing the development of <i>Dirofilaria immitis</i> in cats	<i>Aleah Pullins Dr. Tom McTier</i>	Grand Ballroom
8:25-8:50	Preventive efficacy of various doses and dosage regimens of oral moxidectin against resistant heartworm (<i>Dirofilaria immitis</i>) strains in dogs	<i>Dr. Steven Maeder</i>	Grand Ballroom
8:50-9:20	Laboratory and field studies to investigate the efficacy of a novel, orally administered combination product containing sarolaner, moxidectin, and pyrantel for the prevention of heartworm disease (<i>Dirofilaria immitis</i>) in dogs in the USA	<i>Dr. Kristina Kryda</i>	Grand Ballroom

TIME	SESSION / TITLE	SPEAKER	LOCATION
9:20-9:40	Efficacy of ProHeart® 12, a moxidectin extended-release injectable, for prevention of heartworm disease caused by <i>Dirofilaria immitis</i> in dogs for one year in laboratory and field studies in the USA	<i>Dr. Tom McTier</i>	Grand Ballroom
9:40-10:00	Laboratory safety of ProHeart® 12, a moxidectin extended-release injectable for preventing heartworm (<i>Dirofilaria immitis</i>) disease in dogs for one year	<i>Dr. Matthew Krautmann</i>	Grand Ballroom
10:00 - 10:30 AM Break			Foyer
10:30 AM - 12:30 PM	Session 4: Diagnostics • Moderator: Atkins		
10:30-10:55	<i>Dracunculus</i> sp. infection in a native US (MA) dog associated with false-positive heartworm antigen and heat-treated antigen test results	<i>Dr. Clarke Atkins</i>	Grand Ballroom
10:55-11:20	Heat treatment: Improved detection of male-only <i>Dirofilaria immitis</i> infection and overall assessment of antigen detection of necropsy positive and negative sheltered dogs in Florida, USA	<i>Jeff Gruntmeir</i>	Grand Ballroom
11:20-11:45	Comparison of acid- versus heat-treatment for immune complex dissociation and detection of <i>Dirofilaria immitis</i> antigen in canine plasma	<i>Dr. Lindsay Starkey</i>	Grand Ballroom
11:45-12:10	Comparative evaluation on field samples of two in-clinic assays for heartworm antigen detection in dogs	<i>Dr. Cassan Pulaski</i>	Grand Ballroom
12:10-12:30	The DiroScope: A novel cell-phone-based video microscope for quantitative diagnosis of canine heartworm infection	<i>Dr. Gui Verocai</i>	Grand Ballroom
12:30 - 2:00 PM	LUNCH - Meet the Professors Heartworm Conundrums and Solutions: Your Questions Answered – Part Two	<i>Dr. Clarke Atkins Dr. Marisa Ames</i>	
2:00 - 3:00 PM	Session 4: Diagnostics (cont.) • Moderator: Atkins		
2:00-2:35	Diagnostic testing in heartworm-infected pets: what, when, and where?	<i>Dr. Clarke Atkins</i>	Grand Ballroom

TIME	SESSION / TITLE	SPEAKER	LOCATION
2:35-3:00	Panel Discussion Heat Treatment: Hot Hints and Helpful Tips	Panel: <i>Drs. Atkins, Pulaski, Starkey, Verocai</i>	Grand Ballroom
3:00 - 3:30 PM	Break		Foyer
3:30 - 6:25 PM	Session 5: Pathology • Moderator: Carithers		
3:30-3:50	Early detection of renal damage in heartworm-infected dogs	<i>Dr. Elena Carretón</i>	Grand Ballroom
3:50-4:05	Effect of <i>Wolbachia</i> surface protein on the production of angiogenic factors in canine microvascular endothelial cells	<i>Dr. Rodrigo Morchon</i>	Grand Ballroom
4:05-4:20	Angiogenic response in canine microvascular endothelial cells stimulated with antigenic extracts from <i>Dirofilaria immitis</i> adult worms	<i>Dr. Rodrigo Morchon</i>	Grand Ballroom
4:20-4:35	Clinical and diagnostic imaging findings in 37 rescue dogs with heartworm disease in Germany	<i>Dr. Imke Mäerz</i>	Grand Ballroom
4:35-5:15	Clinical pathological changes in animals with heartworm infections	<i>Dr. Rick Alleman</i>	Grand Ballroom
5:15-6:00	Pathology of the lung during heartworm disease and treatment: Are we looking in the right place?	<i>Dr. Kaori Sakamoto, Dr. Steve Jones</i>	Grand Ballroom
6:00	One-minute Poster Pitches		Grand Ballroom
6:30 - 7:30 PM	Poster Session		Grand Ballroom

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TUESDAY, SEPTEMBER 10

7:00 AM **Breakfast** **Canal St. Foyer**

7:45 Welcome / Introductions / Announcements *Dr. Chris Rehm* Grand Ballroom

8:00 - 10:00 AM Session 6: Resistance in *D. immitis* • Moderator: Atkins

This session is sponsored by Elanco



8:00-8:20 Clinical validation of molecular markers of macrocyclic lactone resistance in heartworm *Prof. Timothy Geary* Grand Ballroom

8:20-8:50 Understanding the genetic basis of macrocyclic lactone resistance in *Dirofilaria immitis*: Progress towards defining changes in the heartworm genome underlying resistance *Prof. Roger Prichard* Grand Ballroom

8:50-9:10 Using predictive statistical models to gain further insights into the factors underlying the measurement of efficacy and to improve the design of studies for heartworm preventive drugs *Dr. Anand Vidyashankar* Grand Ballroom

9:10-9:25 Using population genetics to examine relationships of *Dirofilaria immitis* based on both macrocyclic lactone-resistance status and geography *Dr. Ray Kaplan* Grand Ballroom

9:25-10:00 Panel Discussion Resistance Realities Panel: *Drs. Atkins, Geary, Kaplan, Prichard, Vidyashankar* Grand Ballroom

10:00-10:30 **Break** **Foyer**

10:30 AM - 12:00 PM Session 7: *Wolbachia* Control / Implications • Moderator: Rumschlag

10:30-10:55 Evaluation of different dosages of doxycycline during the adulticide treatment of *Dirofilaria immitis* in dogs *Dr. Elena Carretón* Grand Ballroom

TIME	SESSION / TITLE	SPEAKER	LOCATION
10:55-11:15	Efficacy and side effects of doxycycline versus minocycline in the three-dose melarsomine canine adulticidal heartworm treatment protocol	<i>Dr. Molly Savadelis</i>	Grand Ballroom
11:15-11:40	Research and development of short-course anti- <i>Wolbachia</i> macrofilaricides: Opportunities for repurposing as heartworm indications	<i>Dr. Joseph Turner</i>	Grand Ballroom
11:40-12:00	Heartworm control in Grenada, West Indies: Results of a field study using imidacloprid 10% + moxidectin 2.5% (Advantage Multi®, Advocate®) and doxycycline for naturally acquired <i>Dirofilaria immitis</i> infections	<i>Dr. Tara Paterson</i>	Grand Ballroom
12:00 - 1:30 PM Luncheon and Business Meeting			Grand Ballroom

1:30 - 3:30 PM Session 8: Immunology • Moderator: Carithers

This session is sponsored by Boehringer-Ingelheim



1:30-1:50	Discussion of the microfilarial and larval immune response of <i>Dirofilaria immitis</i>	<i>Dr. Doug Carithers</i>	Grand Ballroom
1:50-2:15	Extracellular vesicles and their involvement in antifilarial drug mode of action	<i>Dr. Michael Kimber</i>	Grand Ballroom
2:15-2:40	Unraveling the structure and function of the filarial nematode excretory-secretory system	<i>Dr. Mostafa Zamanian</i>	Grand Ballroom
2:40-3:05	Macrocyclic lactone anthelmintic-induced leukocyte binding to <i>Dirofilaria immitis</i> microfilariae: Influence of the drug resistance status of the parasite	<i>Dr. Adrian Wolstenholme</i>	Grand Ballroom
3:05-3:30	Panel Discussion Heartworm Preventives and the Immune System	Panel: <i>Drs. Carithers, Kimber, Wolstenholme, Zamanian</i>	Grand Ballroom

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TIME	SESSION / TITLE	SPEAKER	LOCATION
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3:30 - 4:00 PM Break

Foyer

4:00 - 5:30 PM Session 9: Treatment • Moderator: Ames

4:00-4:20	Can the adulticide protocol for canine heartworm be shorter?	<i>Dr. Elena Carretón</i>	Grand Ballroom
4:20-4:55	Treatment of dogs with severe heartworm disease	<i>Dr. Marisa Ames</i>	Grand Ballroom
4:55-5:30	Heartworm treatment: Dog in a box, but not bored	<i>Dr. Debra Horwitz</i>	Grand Ballroom

WEDNESDAY, SEPTEMBER 11

7:00 AM Breakfast

Canal St. Foyer

7:45	Welcome / Introductions / Announcements	<i>Dr. Chris Duke</i>	Grand Ballroom
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8:00 - 9:10 AM Session 10: Heartworm Disease in the Shelter Setting • Moderator: DiGangi

This session is sponsored by Elanco



8:00-8:20	Colorado dog importation and increases in heartworm prevalence	<i>Dr. Jason Drake</i>	Grand Ballroom
8:20-8:40	Transferring and treating heartworm-positive dogs in a low-prevalence setting: A Canadian sheltering perspective	<i>Dr. Karen Ward</i>	Grand Ballroom
8:40-9:10	2019 Shelter heartworm management practices survey	<i>Dr. Brian DiGangi</i>	Grand Ballroom

9:10 - 10:30 AM Session 11: Feline Heartworm Disease / HARD • Moderator: Jones

9:10-9:40	Comparison of <i>Dirofilaria immitis</i> antigen and antibody test results to gross necropsy, histopathology, and radiographic findings in adult shelter cats in northeast Alabama	<i>Dr. Tom Nelson</i>	Grand Ballroom
9:40-10:10	Feline heartworms: Often forgotten	<i>Dr. Stephen Jones</i>	Grand Ballroom
10:10-10:30	Panel Discussion Atypical Hosts: Feline Heartworm Infection	Panel: <i>Drs. Atkins, Cousins, Jones, Nelson</i>	Grand Ballroom

SCIENTIFIC PROGRAM



2019
TRIENNIAL
SYMPOSIUM

AMERICAN HEARTWORM SOCIETY™

TIME	SESSION / TITLE	SPEAKER	LOCATION
10:30 - 11:00	Break		Foyer
11:00 AM - 12:00 PM	Session 12: Compliance • Moderator: Nelson		
11:00-11:25	Heartworm prevention: The dog owner perspective	<i>Dr. Edward Wakem</i>	Grand Ballroom
11:25-12:00	Panel Discussion Championing Compliance	<i>Drs. Ames, Duke, Jones, Nelson, Wakem, Rehm</i>	Grand Ballroom

POSTERS | MONDAY, SEPTEMBER 9 | 6:30 - 7:30 PM | GRAND BALLROOM

- Dirofilariosis could be a risk factor for the development of allergies in humans
Dr. Elena Carretón
- Acetic acid as an alternative reagent in the modified Knott test
Christopher Evans
- Implementation of a novel heartworm prevention strategy through community engagement in low-income urban neighborhoods
Lindsay Goldring
- Melarsomine is expensive - what treatment options are successful or not in low income communities?
Dr. Tammy Hornak
- Wellness clinics slow the spread of heartworm disease in socially depressed areas
Dr. Tammy Hornak
- The emergence and spread of multiple-drug resistance in the canine hookworm, *Ancylostoma caninum*: How will this impact recommendations for use of heartworm preventives?
Dr. Ray Kaplan
- Use of a subcutaneously implanted *in vivo* chamber system cannot reproduce the high therapeutic *in vivo* efficacy of ivermectin against L3/L4 stage larvae of a highly susceptible strain (Missouri) of *Dirofilaria immitis*
Dr. Ray Kaplan
- Comparison of ABC transporter gene expression in adult *Dirofilaria immitis* worms following 24 and 48 hours of *in vitro* treatment with ivermectin, doxycycline, or a combination of both
Chiara Lucchetti
- An *in vitro* larval growth model of *Dirofilaria immitis* for drug evaluation against veterinary heartworm
Dr. Amy Marriott
- Prevalence of canine and human dirofilariosis in Puebla, Mexico
Dr. Rodrigo Morchon
- Improved real-time PCR diagnostics for *Dirofilaria immitis* utilizing a next-generation sequencing-based approach to target selection and assay design
Nils Pilotte
- Updating the diagnostic algorithm for evaluating cases of suspected macrocyclic lactone-resistant heartworm infection
Dr. Cassan Pulaski
- Primary canine dermal multitissue *in vitro* three-dimensional (3-d) organoid microenvironments: investigative platforms in the development of *Dirofilaria immitis* microfilaria filarids (mf)
Miguel Suderman
- Characterization of circulating heartworm antigen in canine serum using size exclusion, rapid immunochromatographic assay, and gel-free Western analysis
Dr. Enqing Tan
- Declarative distribution and evolution of canine heartworm prevalence in Hungary: From 2010 to Today
Dr. Marie Varloud
- Field assessment of a multimodal prophylactic strategy (dinotefuran-permethrin-pyriproxyfen and milbemycin oxime-praziquantel) against canine vector-borne diseases in Corsica
Dr. Marie Varloud
- Genome sequence comparisons of drug-resistant and susceptible strains of *Dirofilaria immitis*
Dr. Adrian Wolstenholme

POSTERS | MONDAY, SEPTEMBER 9 | 6:30 - 7:30 PM | GRAND BALLROOM

STUDENT POSTERS

- Evaluation of canine heartworm antigen tests for estimating community infection in the Cumberland Gap region of Tennessee
Autumn Brehm
- Prevalence, prevention, and perceptions of canine heartworm in the Cumberland Gap region of Tennessee
Briana Cappiello
- Macrocyclic lactone (ML) anthelmintics lack meaningful *in vitro* activity against L3 and L4 stages of both ML-susceptible and ML-resistant *Dirofilaria immitis*
Dr. Pablo Jimenez Castro
- A rapid, parasite-dependent cellular response to *Dirofilaria immitis* in the jird (*Meriones unguiculatus*)
Katie Day
- Reducing ambiguity in canine heartworm disease classification
Kathleen Kila
- Establishing *Dirofilaria immitis* seroprevalence in feral and shelter cat populations in south Louisiana
Taurine Main
- Wiley coyote causing trouble again – heartworm reservoirs in Michigan
Bethany Myers
- Investigation of mosquito vectors for canine heartworm infection in the Cumberland Gap region
Michelle Norden
- *Dirofilaria immitis* vectors: diversity and prevalence of mosquito species found in the Cumberland Gap region of Tennessee from 2017 to 2019
Stephanie Soltis
- Effects of heat pretreatment method on heartworm antigen detection on dogs
Telea Wade-LaHart