AMCOP 64, June 7-9, 2012
Truman State University
Kirksville, Missouri

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Officers for 2012

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Western Illinois University

Program Officer …..……Dr. Lin Twining
Truman State University

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Wilmington College

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Acknowledgements

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THE MEMBERSHIP OF AMCOP
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Schedule

THURSDAY, JUNE 7, 2012

3:00-6:00 pm Dorm Check-in at West Campus Suites
Corner of First and Normal Streets

6:00 -9:00 pm Opening Mixer at Kirksville Arts Center
117 S. Franklin St. (6 blocks North of campus)

FRIDAY, JUNE 8, 2012
2001 Magruder Hall

8:00am Continental Breakfast, Poster Setup, Silent Auction Setup,in Magruder 2012.

8:40 Opening Remarks and Welcome

- Dr. Lin Twining, Program Officer
- Dr. Jon Gering, Dean of the School of Math and Science, Truman State University

CONTRIBUTED PAPERS
(STUDENT PAPERS INDICATED BY *)

9:00 **1.*** Relative roles of host exposure and parasite establishment in determining helminth burdens of Eptesicus fuscus (Chiroptera: Vespertilionidae). **ELIZABETH M. WARBURTON (GS)** and MAARTEN J. VONHOF (MP), Department of Biological Sciences, Western Michigan University, Kalamazoo, MI, 49008.

9:15 **2.*** The influence of anuran host species on site fidelity of Halipegus occidualis. **HEATHER A. STIGGE (GS)** AND MATTHEW G. BOLEK (MP). Department of Zoology, Oklahoma State University, Stillwater, Oklahoma, 74078.

9:30 **3.*** PARASITE DECLINE AS A DRIVING FACTOR OF DEER MOUSE (Peromyscus maniculatus) POSTFIRE POPULATION GROWTH **Jonathan Vaughn (GS)** and

Shawn Meagher (MP), Department of Biological Sciences, Western Illinois University, Macomb, IL 61455

9:45 **4.*** Evaluating the effects of a native nematode species of the genus Deladenus (Thorne 1941) on the woodwasp Sirex nigricornis F. (Hymenoptera: Siricidae) from southern Illinois and Louisiana. **ELLIOTT ZIEMAN (GS)**, JOHN REEVE (MP) and F. AGUSTIN JIMÉNEZ (MP), Department of Zoology, Southern Illinois University Carbondale, Carbondale, IL 62901.

10:00 Break & Silent Auction Bidding, Poster Setup.

10:15 **5.*** Host Specificity of Juvenile White Grub (Posthodiplosotmum minimum) in Spring Lake, McDonough County, IL. **BETH LANE (GS)** AND SHAWN MEAGHER (MP), Department of Biological Sciences, Western Illinois University, Macomb, IL 61455,

10:30 **6.*** Helminth Parasites of Illinois Bobcats. **SHELBY J. HIESTAND (GS)**, AGUSTIN JIMENEZ (MP), and CLAY NIELSEN (MP), Dept of Zoology and Cooperative Wildlife Research Laboratory, Southern Illinois University Carbondale, Carbondale, IL 62901

10:45 **7.*** Deorphanization of a Bacterial Lipopolysaccharide-recognizing G protein-coupled Receptor in Entamoeba histolytica. **MATT BREWER (GS)** and STEVE CARLSON (MP). Department of Biomedical Sciences, Iowa State University College of Veterinary Medicine, Ames, IA 50010

11:00 **8*** Degradation and utilization of complex carbohydrates by Trichomonas vaginalis. **RYAN D. HUFFMAN (GS)**, LAUREN D. NAWROCKI (GS), TYLER J. NIELSEN (GS), WAYNE A. WILSON[a] (MP), ANDREW BRITTINGHAM (MP), Department of Microbiology and Immunology, and [a]Department of Biochemistry and Nutrition, Des Moines University, Des Moines, IA 50312

11:15 **9.** Infection with *Haemoproteus iwa* reduces vector movement in a hippoboscid fly – frigatebird system. **IRIS I LEVIN (PD)** and PATRICIA G PARKER (MP),.

Department of Biology, University of Missouri – St. Louis. One University Blvd. St. Louis, MO 63121.

11:30 Lunch

THE AMCOP SYMPOSIUM
2001 Magruder Hall

1:00 **10.** The Importance of the Unimportant. **JOHN JANOVY, JR**., School of Biological Sciences, University of Nebraska-Lincoln, Lincoln, NE 68588-0118

2:00 **11.** Understanding the histories of parasites of Galapagos birds. **PATRICIA PARKER (MP),** IRIS LEVIN (GS, PD), ELOISA SARI (GS), JENNI HIGASHIGUCHI (GS), JAMIE PALMER (GS), EMILY GEEST (US), DAN HARTMAN (GS), Department of Biology, University of Missouri – St. Louis, St. Louis, MO 63121

POSTER SESSION
Main Hallway Magruder Hall

3:45 **12.*** Development of a Real-time PCR Protocol for the Detection of Lyme Disease and Babesiosis. **MICHAEL LEHRKE (UG)** and KIMBERLY BATES (MP), Department of Biology, Winona State University, Winona, MN 55987.

13.* **I**nteractions in Helminth/Coccidia co-infections in long-tailed macaques (*Macaca fasicularis*) on Bali. **JUSTIN WILCOX (GS)**, KELLY LANE (PD), HOPE HOLLOCHER (MP), and AGUSTIN FUENTES (MP), Department of Biological Sciences, University of Notre Dame, Notre Dame, IN, 46556-5645.

14.* Cellular immune interactions between larval blood flukes, *Schistosoma mansoni*, and its snail invertebrate host, *Biomphalaria glabrata*. **UTIBE BICKHAM (GS)** and TIMOTHY P. YOSHINO (MP), Department of

Pathobiological Sciences, University of Wisconsin, Madison, WI 53706.

15. Identification of plasma proteins with *Schistosoma mansoni* larval-binding activity suggests a lectin-based immunorecognition system in the snail host. **XIAO-JUN WU**[1], HONG-DI LIU[1], LAURA A. GONZALEZ[1], GREG SABAT[2], TIMOTHY P. YOSHINO[1]. [1]Department of Pathobiological Sciences, School of Veterinary Medicine, University of Wisconsin-Madison, [2]Biotechnology Center-Mass Spectroscopy Unit, University of Wisconsin-Madison

16. Intestinal parasites of Fisher (*Martes pennanti)*. KERBE NORBERG (UG), COREENA DAVIDSON (UG), ZAKARIYA SALAH (UG), PATRICK FOOTE (UG), MATTHEW GREATENS (UG), MICHELLE RATHS (UG) AND **KIMBERLY BATES (MP)**, Department of Biology, Winona State University, Winona, MN 55987.

17. The Ideal Concentration of Pyrrolidine Dithiocarbamate to Completely Arrest *Toxoplasma gondii* Replication NICHOLAS ELWERT (UG) and **DOUGLAS B. WOODMANSEE (MP)** Department of Biology, Wilmington College, 1870 Quaker Way, Wilmington, OH 45177

BANQUET
Georgian Room, Student Union Building
6:00 pm

SCOTT D. SNYDER
Associate Vice Chancellor of Research and Creativity
University of Nebraska at Omaha

18. Parasite Biodiversity: Reflections, Challenges and Opportunities.

SATURDAY, JUNE 8, 2012.
2001 Magruder Hall

8:00am Continental Breakfast & Silent Auction Bidding

8:45 Silent Auction Bidding Closes

8:45 **19**. Anoxia resistance in the ticks *Dermacentor variabilis* and *Amblyomma americanum* (Acari: Ixodidae). ERIN SANDERS (UG), KATIE LOOCK (UG) AND **LAURA FIELDEN** (MP), Department of Biology, Truman State University, Kirksville, MO 63501.

9:00 **20.** To stick or not to stick? Life cycle strategies of Paramphistome metacercariae dictate amphibian host specificity. **MATTHEW G. BOLEK (MP)**, M. SUHAIL VHORA (GS), and HEATHER A. STIGGE (GS). Department of Zoology, Oklahoma State University.

9:15 **21.** Discovering the hidden biodiversity of gordiids (Phylum Nematomorpha): Where are we and what are the next steps? **MATTHEW G. BOLEK (MP)**, CLEO SZMYGIEL (GS), ERIN ROGER (US), RYAN SHANNON (US), BEN HANELT (PI), and ANDREAS SCHMIDT-RHAESA (PI). Department of Zoology, Oklahoma State University, Department of Biology, University of New Mexico, and Zoological Museum, University of Hamburg.

9:30 **22**. A Deep Sequencing Approach to Comparatively Analyze the Transcriptome of Lifecycle Stages of the Filarial Worm, Brugia malayi. YOUNG-JUN CHOI 1(GS), ELODIE GHEDIN[2], MATTHEW BERRIMAN[3], JACQUELINE MCQUILLAN[3], NANCY HOLROYD[3], GEORGE F. MAYHEW[1], BRUCE M. CHRISTENSEN[1], **MICHELLE L. MICHALSKI**[4]

9:45 **23**. The role of compatibility and encounter filters in the structure of infracommunities of opossums (Marsupialia: Didelphidae) in French Guiana. **F. AGUSTÍN JIMÉNEZ** (MP), BETH BYLES (UG), R. PHILIP SCHEIBEL (GS) AND FRANÇOIS CATZEFLIS (MP), Department of

Zoology, Southern Illinois University Carbondale, Carbondale, IL 62901 and CNRS UMR 5554, Laboratoire Paléontologie, Case Courrier 064,Université Montpellier 2, Montpellier 34095, France.

10:00 Business Meeting and Award Presentations, **DR. SHAWN MEAGHER**, AMCOP Presiding Officer.

Abstracts

1 Relative roles of host exposure and parasite establishment in determining helminth burdens of *Eptesicus fuscus* (Chiroptera: Vespertilionidae). **ELIZABETH M. WARBURTON (GS)** and MAARTEN J. VONHOF (MP), Department of Biological Sciences, Western Michigan University, Kalamazoo, MI, 49008.
In most host-parasite systems, variation in parasite burden among hosts facilitates transmission dynamics. Heavily infected individuals introduce disproportionate numbers of infective stages into host populations and may cause sharp increases in frequency of infection. Heterogeneity in exposure and susceptibility can cause parasite burdens to vary widely within host populations; however, the unique contributions of each are unclear. This presents possible barriers to developing effective mitigation strategies in threatened human and wildlife populations. To understand why these hosts have heavy burdens, we used *E. fuscus* and its helminths as a model system. Exposure variables (capture location, capture date, water contact) and parasite establishment variables (sex, age, body condition, immune function, genetic heterozygosity) were used to determine which traits influence variation in parasite burden. We captured bats from colonies in Michigan and Indiana then assessed their sex, age class, body condition, functional immunocompetence, and helminth burden. To assess neutral genetic diversity, nineteen autosomal microsatellites were genotyped to assess the heterozygosity of each individual bat. Structural equation modeling revealed the best-fitting model (AIC=16.193) included year of capture and distance of colony to nearest body of water. Of these predictors, distance to nearest water (standard estimate = -0.33) provided a greater contribution than year of capture (standard estimate = -0.10). Thus, differential exposure appears to play a more significant role than differential parasite establishment in creating heterogeneous helminth burdens. Extending this idea to determine if other parasitic taxa in other mammalian species follow similar patterns would provide novel insight into parasite transmission.

2 The influence of anuran host species on site fidelity of *Halipegus occidualis*. **HEATHER A. STIGGE (GS)** AND MATTHEW G. BOLEK (MP). Department of Zoology, Oklahoma State University, Stillwater, Oklahoma, 74078.

The preferential site selection of helminths within their definitive hosts is a well-documented phenomenon; however, the factors that influence site selection by most helminth species remains poorly understood. In North America, species of *Halipegus* infect the digestive tract, buccal cavity, or eustachian tubes of amphibians. Previous field studies indicate that *Halipegus* species always demonstrate conserved site fidelity in their definitive amphibian hosts, but the site specificity of *H. occidualis* appears to be more variable than initially suggested because it has been reported from both under the tongue of green frogs and the stomach of several other anuran hosts. Therefore, it appears that the site specificity of *H. occidualis* might be dependent on the species of amphibian host. In order to investigate this variation in site fidelity, we established this life cycle in the laboratory. Laboratory reared snails were exposed to eggs from worms recovered from the stomach of naturally infected bullfrogs. Cercariae of *H. occidualis* were collected from the snails and exposed to laboratory reared microcrustaceans. Then, infected microcrustaceans were fed to Woodhouse's toads, Grey's treefrogs, and American bullfrogs. Adult gravid worms appeared on the lingual veins under the tongue of toads and treefrogs 50-75 DPI; in contrast, gravid worms never appeared under the tongue of the bullfrogs but remained in the stomach until they were removed. The site fidelity of *H. occidualis* within the bullfrog was further tested by transplanting gravid worms from under the tongue of experimentally infected amphibians into the mouths of uninfected bullfrogs and treefrogs. Gravid worms remained under the tongue of treefrogs for over 8 weeks. In contrast, gravid adults did not remain in the buccal cavity of bullfrogs for longer than 7 days. The transplanted worms were recovered from the stomach 14 days post-transplant. These results suggest that site fidelity of *H. occidualis* is dependent on the species of amphibian definitive host.

3 PARASITE DECLINE AS A DRIVING FACTOR OF DEER MOUSE (Peromyscus maniculatus) POSTFIRE POPULATION GROWTH **Jonathan Vaughn (GS)** and Shawn Meagher (MP), Department of Biological Sciences, Western Illinois University, Macomb, IL 61455

Deer mouse populations increase dramatically following fire in coniferous forests. Several hypotheses for this population boom have been proposed, but none of them have been supported upon being

tested. A possible, but untested, explanation for this mouse population explosion is a change in levels of parasitism: parasites have negative effects on hosts and if parasite densities decrease after a fire, mouse populations will respond positively. Fire may decrease the population density of intermediate hosts of many parasite species, which could consequently lead to lower levels of infection in their definitive host, mice. Here, I test this hypothesis by examining deer mice collected from burned and unburned traplines one year after a stand-replacing forest fire in northwestern Montana. Mice were dissected and inspected for external parasites and gut parasites. Four species of flea, two species of louse, four species of nematode, and two species of tapeworm were identified. Fisher's exact tests were used to test for effects of fire on prevalence, and t-tests for effects on intensity (counts per individual host) of all parasite taxa. No significant effect of fire was found on measures of infection in any parasite taxon, with two exceptions: fire had a positive effect on louse intensity and a negative effect on flea prevalence. These results indicate that parasites are not likely the driving factors of deer mouse postfire population growth, and that further research is needed to identify the variables which are.

4

Evaluating the effects of a native nematode species of the genus *Deladenus* (Thorne 1941) on the woodwasp *Sirex nigricornis* F. (Hymenoptera: Siricidae) from southern Illinois and Louisiana.
ELLIOTT ZIEMAN (GS), JOHN REEVE (MP) and F. AGUSTIN JIMÉNEZ (MP), Department of Zoology, Southern Illinois University Carbondale, Carbondale, IL 62901.
Woodwasps (Hymenoptera: Siricidae) produce phloem eating larvae. Native *Sirex* woodwasps cause little damage to pine trees in their natural ranges. The European woodwasp *Sirex noctilio* F. (Hymenoptera: Siricidae) has caused severe damage in areas of the Southern Hemisphere where it has been accidentally introduced into pine plantations. In 2004 *Sirex noctilio* was discovered in Syracuse, NY. In the Southern Hemisphere some strains of the nematode *Deladenus* (=*Beddingia) siricidicola* (Bedding 1964) have been used as a biological control agent because they are able to castrate woodwasps. *Deladenus siricidicola* has been found infecting *S. noctilio* in Ontario, Canada but in all cases the nematodes did not penetrate the eggs which is the primary mechanism of control. In this study, we examined the effects of native *Deladenus* nematodes on the native woodwasp *S. nigricornis.* These nematodes had a prevalence of 30% in southern Illinois and in all but one wasp the nematodes penetrated the eggs. In this study we will determine what species of *Deladenus* is present in our study sites using morphological and genetic analysis. The

nematodes from both southern Illinois and Louisiana had identical DNA sequences of Cytochrome Oxydase 1 (CO1), indicating they are likely the same species. Further comparisons are needed to determine how closely the morphometric features match previously described species of *Deladenus*.

5 Host Specificity of Juvenile White Grub (*Posthodiplosotmum minimum*) in Spring Lake, McDonough County, IL. **BETH LANE (GS)** AND SHAWN MEAGHER (MP), Department of Biological Sciences, Western Illinois University, Macomb, IL 61455,
Parasites cause harm to humans, domesticated animals, and wildlife. Host specificity is the measure of the number of host species a parasite can infect. White grub (*Posthodiplostomum minimum)* is an important parasite of game fish. Understanding the host specificity of *P. minimum* could help control infection by this species. We know that different species of *P. minimum* are specific to either cyprinids (minnows) or centrarchids (sunfish) but we do not know whether it displays specificity for particular centrarchid species. Two centrarchids, bluegill (*Lepomis macrochirus*; n=82) and crappie (*Pomoxis annularis*; n=89), were collected from Spring Lake in McDonough County, IL. I determined species, sex, age, length, and mass of each fish. The organs were removed and the number of white grubs in them was counted, and total intensity per host was calculated. Prevalence was significantly higher in bluegills (100%) than in crappie (57%). Mean intensity was significantly higher in bluegill (1,474) than crappie (9), and infection levels increased with host length in both species. *Posthodiplostomum minimum* habitat differed in the two hosts. The proportion of white grub found in particular organs was highest in bluegill kidneys (56%) and crappie livers (84%), which may be due to differences in infection levels in the two hosts. In summary, *P. minimum* in Spring Lake is more infective to bluegill than crappie. In the future, studies should be done to see whether then host differences in infection level are due to ecological differences that affect exposure to *P. minimum*, or physiological differences that affect host suitability for infection.

6 Helminth Parasites of Illinois Bobcats. **SHELBY J. HIESTAND** (GS), AGUSTIN JIMENEZ (MP), and CLAY NIELSEN (MP), Dept of Zoology and Cooperative Wildlife Research Laboratory, Southern Illinois University Carbondale, Carbondale, IL 62901
Bobcats (*Lynx rufus*) are the most abundant and widely-distributed wild felid species in North America. Bobcat populations have grown throughout their range since reaching historical lows during the mid-

20th century. Increasing population densities of bobcats raises concerns about how they influence the wildlife community as a host for parasites. Although many parasites found in bobcats also infect other wild and domestic animals, knowledge of bobcat parasites and potential impacts on other species has received relatively little study. Our objectives are to determine endoparasite presence and intensity within bobcats in Illinois. We are examining trapped and road-killed bobcats for parasites in Illinois, where bobcat populations are thriving in the absence of harvest. Necropsies are performed examining the body cavity and internal organs for parasites. Examinations of bobcats have shown infections and prevalence for *Alaria* spp. (45%), *Taenia* spp. (65%), *Mesocestoides* sp. (5%), *Acanthocephala* (5%), *Ancylostoma* sp. (5%), *Molineus* sp. (15%), *Toxocara* spp. (60%), *Toxascaris leonina* (5%), *Trogostoronaylus wilsoni* (10%) and *Oslerus rostratus* (5%). The highest mean abundance was found for *Toxocara* spp. (7.1) and *Taenia* spp. (5.7). *Mesocestoides* sp. had the highest intensity (31.0) with a range of 0-31 and *Molineus* sp. (13.3) with a range of 0-24. *Alaria* sp., *Taenia* sp., and *Toxocara* sp., parasites of zoonotic and domestic interest, were compared from 3 collection locations in southern Illinois (Randolph County, Union County, and Williamston County). Infections caused by *Taenia* sp. and *Toxocara* sp. did not differ among locations, while infections caused by *Alaria* were significantly higher in Union County than the other two sites. Our study provides information to wildlife biologists regarding the potential impacts of growing bobcat populations as a health risk for both wild and domestic animals.

7 Deorphanization of a Bacterial Lipopolysaccharide-recognizing G protein-coupled Receptor in *Entamoeba histolytica.* **MATT BREWER (GS)** and STEVE CARLSON (MP). Department of Biomedical Sciences, Iowa State University College of Veterinary Medicine, Ames, IA 50010

Entamoeba histolytica is the causative agent of amebic dysentery, a worldwide protozoal disease that results in approximately 100,000 deaths annually. The virulence of *E. histolytica* may be due to interactions with host bacterial flora whereby trophozoites engulf colonic bacteria as a nutrient source. The engulfment process depends on trophozoite recognition of bacterial epitopes that activate phagocytosis pathways. EhGPCR-1 was previously recognized as a putative G protein-coupled receptor (GPCR) expressed by *Entamoeba histolytica* and used for phagocytosis. In the present study, we attempted to deorphanize EhGPCR-1 using a heterologous GPCR yeast system. We determined that bacterial lipopolysaccharide (LPS) serves as an agonist for EhGPCR-1, and that LPS stimulates EhGPCR-1 in a

concentration-dependent manner. Additionally, we demonstrated that *Entamoeba histolytica* prefers to engulf bacteria with intact LPS. Thus EhGPCR-1 is an LPS-recognizing GPCR that is a druggable target for treating amebiasis, especially considering the well-established druggability of GPCRs.

8 Degradation and utilization of complex carbohydrates by *Trichomonas vaginalis*. **RYAN D. HUFFMAN** (GS), LAUREN D. NAWROCKI (GS), TYLER J. NIELSEN (GS), WAYNE A. WILSON[a] (MP), ANDREW BRITTINGHAM (MP), Department of Microbiology and Immunology, and [a]Department of Biochemistry and Nutrition, Des Moines University, Des Moines, IA 50312
Trichomonas vaginalis is a protozoan parasite that is the causative agent of trichomoniasis, a widespread sexually transmitted disease that affects millions worldwide. Several reports suggest that infection with this protozoan correlates with a decrease in the glycogen content of the vaginal epithelium. Most studies of *Trichomonas vaginalis* include the maintenance of parasites in media containing either glucose or maltose as carbohydrate sources. Here, we demonstrate that *T. vaginalis* grows equally well in media containing the glucose polymers amylopectin or glycogen as the principal carbon source. Having demonstrated the ability of *Trichomonas* to utilize these polymers to support growth, we sought to analyze cell pellets and culture supernatant for hydrolytic activity towards amylopectin. We hypothesized that *Trichomonas* utilizes glucose polymers by first degrading the polymers into smaller subunits. Our data indicate that *T. vaginalis* possess both cell-associated and secreted hydrolytic activity towards glucose polymers and that activity accumulates in the medium during growth. Furthermore, carbohydrate limitation triggers an increase in both activities. Our initial analysis of the secreted activity reveals enzymatic properties consistent with those of an α-amylase. We postulate that the ability to utilize glycogen is important for growth and pathogenesis of the organism. Current work focuses on the further characterization of these glycosidase activities.

9 Infection with *Haemoproteus iwa* reduces vector movement in a hippoboscid fly – frigatebird system. **IRIS I LEVIN** (PD) and PATRICIA G PARKER (MP),. Department of Biology, University of Missouri – St. Louis. One University Blvd. St. Louis, MO 63121.Studying haemosporidian parasites in their arthropod hosts in natural settings has proved challenging. Here we explore the effects of a haemosporidian parasite, *Haemoproteus iwa*, on a hippoboscid fly vector, *Olfersia spinifera*. *Olfersia spinifera* is an obligate ectoparasite

of the great frigatebird, *Fregata minor*, living exclusively among bird feathers for all of its adult life. There is considerable evidence from mosquito – *Plasmodium* research that haemosporidian parasites can negatively impact their arthropod vectors, but studies in natural settings are rare. This study examines the movements of *O. spinifera* between great frigatebird hosts. Movement, or host-switching, is inferred by analyzing host (frigatebird) microsatellite markers run on host DNA amplified from the vector. Using the most variable microsatellite markers, we are able to identify host genotypes in bloodmeals that do not match the host from which the fly was collected. We analyzed fly bloodmeal – host genotype mismatch using a logistic regression model, and the best-fit model included the *H. iwa* infection status of the fly and the bird host sex. Uninfected flies are more likely than infected flies to have a bird genotype in their blood meal that was different from their current bird host, indicating a recent host switch. Flies collected from female frigatebirds were more likely than those collected from males to have recently switched hosts. Reduced movement of infected flies suggests that there may be a cost of parasitism for the fly. Parasite virulence reducing vector movement has been shown theoretically to be evolutionarily stable if that virulence contributes to a higher success of infection.

10

The Importance of the Unimportant. **JOHN JANOVY, JR**., School of Biological Sciences, University of Nebraska-Lincoln, Lincoln, NE 68588-0118

It could be argued that the main product of academic research is not patents or technological wonders, but the human resources that are generated by the enterprise; that is, the scientists themselves, and especially their students, both undergraduate and graduate. Because parasitism is the most common way of life, the diversity and accessibility of parasitological problems make parasitology a discipline notorious for producing people with transferable skills. The talk will address the way that parasitological problems tend to teach the transferable skills necessary for long-term success regardless of the chosen profession, and that much of that teaching comes from dealing with dumb, microscopic, and uncooperative animals (parasites) that don't cause human disease but are readily accessible throughout the world. I'll illustrate the ideas with some work of my former students.

11 Understanding the histories of parasites of Galapagos birds.

PATRICIA PARKER (MP), IRIS LEVIN (GS, PD), ELOISA SARI (GS), JENNI HIGASHIGUCHI (GS), JAMIE PALMER (GS), EMILY GEEST (US), DAN HARTMAN (GS), Department of Biology, University of Missouri – St. Louis, St. Louis, MO 63121

A large proportion of the animal species inhabiting the Galapagos Islands occur nowhere else, and they are heavily protected by the Galapagos National Park. Parasites and other disease-causing agents are recognized as significant potential threats to this fauna, and we have worked with the Park since 2001 to identify and evaluate the conservation concern of Galapagos parasites, focusing particularly on those infecting birds. We have surveyed 26 endemic bird species on all major islands and used phylogenetic approaches to reconstruct the arrival times of the host lineages and those of the parasites themselves to reveal: (1) parasites that arrived with the colonizing host lineage and evolved alongside their hosts following their joint arrival; (2) parasites that arrived with one colonizing host lineage and then jumped to another host that was already there, or that arrived subsequently; and (3) those that are very recent arrivals likely associated with human development and traffic. In this talk, we will focus on what we understand about the histories of two pathogen groups (Apicomplexan blood parasites and the Avipoxvirus), of special concern because they have been identified as important causative agents in the extinctions of many Hawaiian endemic bird species. Variants of canarypoxvirus arrived in the 1890's in a pattern suggesting human involvement and have since spread to multiple islands where they have strong negative impact on some bird lineages. We have identified several new lineages of Haemosporidian blood parasites, and new evidence suggests that these parasites may arrive regularly through migratory birds during brief stopovers. In the case of the four Plasmodium lineages identified in Galapagos endemic birds, only one shows evidence of having established regular transmission on the islands. None of the endemic bird species appear to be competent hosts, but antibody tests suggest broad exposure. We are working to identify the resident reservoir and vector in this transmission dynamic on the islands, focusing on the only two introduced birds with breeding populations on the islands, and the two introduced mosquitoes. We hope to be able to recommend an avenue to eliminate the established Plasmodium parasite, if it is maintained entirely by introduced species, before one of the endemics becomes a competent host.

12 Development of a Real-time PCR Protocol for the Detection of Lyme Disease and Babesiosis. **MICHAEL LEHRKE (UG)** and DR. KIMBERLY BATES (MP), Department of Biology, Winona State University, Winona, MN 55987.

Lyme disease and Babesiosis are emerging infectious diseases particularly prevalent in the regions of southeast Minnesota and west central Wisconsin. The causative agent of Lyme disease is the spirochete bacteria *Borrelia burgdorferi*, which is transferred to humans via the black-legged deer tick, *Ixodes scapularis*. Babesiosis, caused by the malaria-like parasite *Babesia microti* also shares the same *I. scapularis* vector. To determine the prevalence of both diseases in the regions of southeast Minnesota and west central Wisconsin, real-time PCR (qPCR) protocols are being developed to efficiently detect each pathogen in *I. scapularis* tick samples collected from each area. Ticks were harvested from white-tailed deer (*Odocoileus virginianus*) and DNA was extracted using a Chelex-100 DNA extraction method. Previously, conventional PCR was being utilized to detect both pathogens in the tick samples, however it is a tedious and time consuming procedure. Therefore, a qPCR method has been developed to enhance the testing time of the samples. To increase the reliability of the results, the newly designed qPCR protocols feature a multiplex reaction, detecting both the target organisms as well as an internal control for the *I. scapularis* DNA. The sensitivity and specificity of the new qPCR protocol is being determined by comparing results to ones obtained using conventional PCR on the same tick samples. Preliminary results indicate that the qPCR protocols are both specific and sensitive to their respective species as well as the *I. scapularis* internal control. Once development is complete the new protocols will then be used to complete the testing of tick samples that have been collected since 2005, giving a clear picture of how the prevalence of both diseases has increased in southeast Minnesota and west central Wisconsin.

13 Interactions in Helminth/Coccidia co-infections in long-tailed macaques (*Macaca fasicularis*) on Bali. **JUSTIN WILCOX (GS)**, KELLY LANE (PD), HOPE HOLLOCHER (MP), and AGUSTIN FUENTES (MP), Department of Biological Sciences, University of Notre Dame, Notre Dame, IN, 46556-5645.

While infectious diseases have historically been viewed in terms of the pathology caused by a single pathogen in a single host, a growing body of literature is indicating that co-infections by multiple types of pathogens are ubiquitous in both human and wild populations and may be subject to important interactions with one another. These

interactions have been particularly well documented in co-infections with helminthes and intracellular parasites. This study utilized data collected on enteric pathogens of wild long-tailed macaques from Bali, Indonesia to assess the potential for helminthes to influence infections with intracellular coccidian parasites, particularly those belonging to the the genera *Cryptosporidium* and *Isospora*. It was found that infection with coccidians of the genus *Cryptosporidium* was significantly more likely if helminthes were present, and that shedding of both *Cryptosporidium* and *Isospora* were higher in cases of co-infection with several but not all species of helminth parasite. This study's findings are unlikely to be the result of simple confounding in exposure events between coccidia and helminthes, and alternative explanations are discussed.

Cellular immune interactions between larval blood flukes, *Schistosoma mansoni*, and its snail invertebrate host, *Biomphalaria glabrata*.

14 **UTIBE BICKHAM (GS)** and TIMOTHY P. YOSHINO (MP), Department of Pathobiological Sciences, University of Wisconsin, Madison, WI 53706.

The immune response of humans infected by various schistosome species can result in schistosomiasis. An understanding of the parasite activities within its snail invertebrate host and the immune response elicited by the snail could contribute to the knowledge of human innate immune responses to the trematodes. In the case of *Schistosoma mansoni*, *Biomphalaria* spp. are the obligate invertebrate hosts. To date, the mediators of the differential immune responses observed in susceptible *Biomphalaria* snail strains, in which the parasite is able to continue normal development, and resistant snails, in which the parasite can be successfully eliminated remains unknown. In the present study, the *B. glabrata* embryonic (Bge) cell line, which shares functional similarities with hemocytes, the primary effector cells of *B. glabrata*, will be used as a surrogate for the snail host. Specifically, affinity chromatographic and proteomic approaches will be used to identify the potential pathogen recognition receptors (PRRs) of Bge cells and their respective pathogen-associated molecular patterns (PAMPs) on the primary sporocyst of *S. mansoni*. Soluble lectins (carbohydrate binding proteins) such as the fibrinogen-related proteins (FREPs) and C-type lectins are known to be present in Bge cells as well as B. *glabrata* hemocytes. Additionally, the glycotopes of *S. mansoni* has been shown to vary during *S. mansoni* larval transformation. The *in vitro* model described above will be used to test the hypothesis that the interaction of *B. glabrata* hemocytes lectins and their respective glycans on larval *S.mansoni* are involved in the binding/recognition of the parasite by

hemocytes of its snail invertebrate host. A far-Western blot approach was used to investigate the binding activity of proteins found in the cytosol or membrane extracts of Bge cells with tegumental proteins of primary sporocyst of *S. mansoni*. Preliminary results show that molecular interactions between the 'surrogate' host (Bge cells) and parasite are maintained even after subcellular fractionation of the partners comprising this experimental model. In future studies, these protein enriched fractions will be used to identify/characterize the Bge cell lectins and their respective glycan ligands on *S. mansoni* primary sporocyts.

15 Identification of plasma proteins with *Schistosoma mansoni* larval-binding activity suggests a lectin-based immunorecognition system in the snail host. **XIAO-JUN WU**[1], HONG-DI LIU[1], LAURA A. GONZALEZ[1], GREG SABAT[2], TIMOTHY P. YOSHINO[1]. [1]Department of Pathobiological Sciences, School of Veterinary Medicine, University of Wisconsin-Madison, [2]Biotechnology Center-Mass Spectroscopy Unit, University of Wisconsin-Madison
Previous studies have shown that both plasma and hemocyte components of *Biomphalaria glabrata* snails are involved in innate immune resistance to early larval stages of selected strains of *Schistosoma mansoni*. However, the molecular basis for this complex interaction between the parasite and these immune elements is still poorly understood. Because of the presence of a highly-diversified family of lectin-like fibrinogen-related proteins (Freps) in *B. glabrata* plasma and recent evidence that a member(s) of the Frep3 subfamily may be involved in snail resistance to schistosomes (Hanington et al., 2011), we have employed affinity chromatographic methods and proteomic analyses to begin identifying potential pathogen-recognition receptors in plasma that bind selectively to the sporocyst surface tegument and larval protein (larval transformation proteins or LTPs) released during early schistosome development. Based on proteomic analyses of eluted plasma proteins from affinity matrices, Freps from several subfamilies, including Frep3, and a C-type lectin were identified from the tegument and LTP columns. Affinity chromatographic enrichment of this subset of plasma proteins supports the presence of a lectin-based immunorecognition system in *B. glabrata* that is potentially involved in regulating snail-schistosome interactions during initial host infection.

16 Intestinal parasites of Fisher (*Martes pennanti)*. KERBE NORBERG (UG), COREENA DAVIDSON (UG), ZAKARIYA SALAH (UG), PATRICK FOOTE (UG), MATTHEW GREATENS (UG), MICHELLE RATHS (UG) AND **KIMBERLY BATES (MP),** Department of Biology, Winona State University, Winona, MN 55987.
Intestinal parasite populations of fisher (*Martes pennanti*) have not been studied since 1979.[1] Since then, the numbers of fisher have increased in the central and southern parts of Wisconsin but have dropped in the north. Habitat loss, direct competition of resources from other carnivores, and possible disease/parasite increases are some of the theories that might explain the decreasing populations. With the collaboration of Dr. Michelle Michalski and the University of Wisconsin – Oshkosh, parasites were collected from the hearts, lungs, intestinal tracts, and kidneys of 100 legally harvested fisher carcasses. Intestinal tracts and kidneys were dissected at Winona State University on order to collect and identify parasites. The kidneys were sliced and checked for the presence of worms. The intestinal tracts were cut open from the beginning of the small intestine to the end of the large intestine. The contents of the intestines were then forced through four-layers of varying molecular weight sieves and washed with water. The retentate from each of the sieves were collected individually and examined for parasites. Recovered parasites were preserved in 70% ethanol and stored for later clearing, staining, and mounting. Data obtained from each fisher included which county the fisher was from, whether it was urban or rural, whether it was trapped or hunted, and the gender of the animal. Age data was collected for a select number of fisher, so not all of these samples were aged. Four genera of helminths were identified, *Alaria*, *Molineus*, *Capillaria* and *Taenia*. These were identified based on morphological characteristics as compared to published data on fisher and mink *(Mustela vison).* Specimens have currently been stained, cleared and some mounted for submission to the University of Nebraska State Museum Systematics Research Collections so the data may be used to correlate the increase or decrease in fisher populations in Wisconsin.

17 The Ideal Concentration of Pyrrolidine Dithiocarbamate to Completely Arrest *Toxoplasma gondii* Replication NICHOLAS ELWERT (UG) and **DOUGLAS B. WOODMANSEE (MP)** Department of Biology, Wilmington College, 1870 Quaker Way, Wilmington, OH 45177
This experiment aims to determine the ideal concentration of pyrrolidine dithiocarbamate (PDTC) to completely arrest replication of the parasite, *Toxoplasma gondii*, while showing no toxic effects to the host cells or parasite. Eighteen HS27 cell culture dishes were

established then inoculated with $1x10^6$ *Toxoplasma gondii* tachyzoites. After an hour exposure, dishes were washed and placed back into the incubator for 24 hours. After 24 hours, 12 plates were treated with the following concentrations for six hours (two replicates per concentration): 10μM, 20μM, 30μM, 40μM, 50μM, and 75μM. The remaining six plates were used as controls. Two controls were taken before PDTC application, while the four remaining controls were taken after the allotted 6 hours for PDTC treatment. Following PDTC treatment, slides within the dishes were stained using an iron hematoxylin stain and the number of parasites/vacuole were counted blindly. Following two PDTC trials, the ideal concentration of PDTC showing a complete arrest of replication and no toxic effects was determined to be between 30μM-40μM. By determining this ideal PDTC concentration, we are able to use PDTC as an experimental model to investigate the regulation of regulatory proteins of the cell cycle.

18 Parasite Biodiversity: Reflections, Challenges and Opportunities.
SCOTT D. SNYDER. Office of Research, University of Nebraska, Omaha, NE 68182.
As parasitologists we commonly and even casually assert that parasitism is the most common mode of life on earth. One of the things we really mean is that there are more species of parasites on the planet than there are species of hosts. This assertion is almost certainly true, although the data behind the assertion mostly come from humans and vertebrates of economic importance. Our understanding of parasite biodiversity in other host groups is much more limited to islands of illumination in a very large, very dark sea of ignorance. The barriers to additional illumination are considerable and include limited funding, inadequate taxonomic expertise, and host biologists who are unwilling to fully partner with parasitologist colleagues. The rewards of comprehending parasite biodiversity are immense and can provide us with a fine-grained understanding of biogeographical history, trophic interactions, ecological interconnectedness, and evolutionary interrelatedness.

19 Anoxia resistance in the ticks *Dermacentor variabilis* and *Amblyomma americanum* (Acari: Ixodidae).
ERIN SANDERS (UG), KATIE LOOCK (UG) and **LAURA FIELDEN** (MP), Department of Biology, Truman State University, Kirksville, MO 63501.
Ticks are blood –feeding arthropods that can survive very harsh environmental conditions in the absence of a suitable host. These

conditions can include periods of low oxygen due to periodic flooding or periods of anoxia, the absence of oxygen, while covered by snow and ice. This study investigates anoxia tolerance in adult, nymph and larval stages of two common species of North American tick, the dog tick *Dermacentor variabilis* and the lone star tick *Amblyomma americanum*. Diffusion resistant bags depleted of oxygen using anaerobic pouches were used to simulate anoxic conditions at 25^0C. Unfed adult ticks survived for six days, nymphal ticks survived for four days and larval ticks for one day in anoxia. *Amblyomma americanum* showed higher anoxia resistance than did *D. variabilis*. Tolerance of anoxia in ticks appears to result from metabolic depression.

20 To stick or not to stick? Life cycle strategies of Paramphistome metacercariae dictate amphibian host specificity. **MATTHEW G. BOLEK (MP)**, M. SUHAIL VHORA (GS), and HEATHER A. STIGGE (GS). Department of Zoology, Oklahoma State University.

Megalodiscus temperatus and *Allassostomoides parvus* are North American paramphistomes that infect amphibians and reptiles. Both species have similar life cycles and involve *Planorbella trivolvis* snails as the first intermediate host and the formation of metacercariae on either amphibian skin for *M. temperatus* or on amphibian skin and invertebrates for *A. parvus*. Amphibians become infected with these worms when they ingest their shed skin or invertebrate hosts containing metacercariae. Although very similar in their life cycles, these species differ drastically in their host specificity at the definite host level. *Megalodiscus temperatus* is a generalist reported from 24 amphibian species; whereas *A. parvus* has narrower host specificity and is reported from 2 amphibian species. In order to investigate these differences in host specificity, we conducted large scale field surveys and controlled experimental hosts specificity studies in amphibian hosts. Our surveys indicated that *M. temperatus* infected 7 species of anurans, whereas *A. parvus* only infected 1 species of anuran. In the laboratory both *M. temperatus* and *A. parvus* formed metacercariae on all amphibian species exposed. However, differences existed in the length of time that metacercariae of these 2 species remained on the skin of their amphibian hosts. Metacercariae of *M. temperatus* remained on skin of all anuran species exposed; whereas metacercariae of *A. parvus* dropped of the skin of all amphibian species exposed within minutes to hours. As a result, all anuran species that ingested their shed skin became infected with *M. temperatus*, but not with *A. parvus*. However, when metacercariae of *A. parvus* were feed to anurans, all individuals

became infected. Our data suggest that paramphistome species specific differences in the ability of metacercariae to remain attached to amphibian skin may have consequences on anuran colonization and host specificity among amphibian paramphistome trematodes.

21 Discovering the hidden biodiversity of gordiids (Phylum Nematomorpha): Where are we and what are the next steps? **MATTHEW G. BOLEK (MP)**, CLEO SZMYGIEL (GS), ERIN ROGER (US), RYAN SHANNON (US), BEN HANELT (PI), and ANDREAS SCHMIDT-RHAESA (PI). Department of Zoology, Oklahoma State University, Department of Biology, University of New Mexico, and Zoological Museum, University of Hamburg. Approximately 350 species of gordiids have been described worldwide from 19 extent and 2 extinct genera; but estimates suggest that only 15% of the hairworm diversity has been documented globally. Our lack of knowledge of the biodiversity of gordiids stems from the facts that most hairworm species have been describe based on random collections of single worms for which life cycles are unknown. However, over the last 5 years, our team has developed novel and unique collecting and culturing techniques for gordiids that overcome these shortfalls. First, our studies on the distribution of gordiids by using cyst stages indicate that nematomorph cysts in aquatic snails are the most common stages of gordiids to detect in the environment and are extremely easy to collect over large geographical areas. Second, cysts can be identified to genus/clade and can produce adult worms in the laboratory when fed to appropriate arthropod hosts. Third, our recent discovery of the ability of gordiid cysts from North American and African species of hairworms to survive freezing and produce viable adult worms when fed to laboratory reared hosts indicates that this technique will enable us to collect cyst stages of gordiids anywhere in the world and establish their life cycles in the laboratory. I will discuss our advances in these novel techniques along with their pitfalls which should allow us, for the first time, to move forward in discovering the hidden diversity of gordiids globally and test hypotheses on their distribution and biodiversity.

22 A Deep Sequencing Approach to Comparatively Analyze the Transcriptome of Lifecycle Stages of the Filarial Worm, Brugia malayi. YOUNG-JUN CHOI 1(GS), ELODIE GHEDIN[2], MATTHEW BERRIMAN[3], JACQUELINE MCQUILLAN[3], NANCY HOLROYD[3], GEORGE F. MAYHEW[1], BRUCE M. CHRISTENSEN[1], **MICHELLE L. MICHALSKI**[4]

[1]University of Wisconsin-Madison, Madison, WI, United States, [2]University of Pittsburgh School of Medicine, Pittsburgh, PA, United States, [3]Wellcome Trust Sanger Institute, Cambridge, United Kingdom, [4]University of Wisconsin Oshkosh, Oshkosh, WI, United States

Developing new interventions for the control of parasitic nematodes continues to be a significant challenge. Genomics and post-genomics approaches play an increasingly important role for providing fundamental molecular information about these parasites, thus enhancing basic as well as translational research. Using Illumina high-throughput sequencing, we have undertaken a comprehensive genome-wide survey of the developmental transcriptome of the human filarial parasite *Brugia malayi*. Over 100 million paired-end reads were generated from polyA-tailed mRNA from seven life cycle stages: eggs & embryos, immature MF (of less than 3 days of age), mature MF, L3, L4, adult male and adult female. While deep sequencing data are highly informative in identifying novel transcribed elements and splice variants that help improve the genome annotation, the present study aims to characterize transcriptome changes along the progression of filarial life cycle to further our understanding of the molecular biology of the parasite. Examining the developmental transcriptome profiles of *B. malayi* revealed major transitions in RNA expression from eggs through larval stages to adults. Using statistical approaches, we identified groups of genes with distinct life stage dependent transcriptional patterns and functional categories over-represented in each of these groups. Global transcriptional differences were further evaluated between pairs of stages with particular emphasis on (i) MF maturation, (ii) late larval development, (iii) sex differences, and (iv) intrauterine reproductive processes. Overall, our analysis provides a first comprehensive view of the life cycle transcriptome of *B. malayi*, revealing the dynamics of gene expression during parasite development.

23 The role of compatibility and encounter filters in the structure of infracommunities of opossums (Marsupialia: Didelphidae) in French Guiana. **F. Agustín Jiménez** (MP), Beth Byles (UG), R. Philip Scheibel (GS) and François Catzeflis (MP), Department of Zoology, Southern Illinois University Carbondale, Carbondale, IL 62901 and CNRS UMR 5554, Laboratoire Paléontologie, Case Courrier 064,Université Montpellier 2, Montpellier 34095, France.

A total of 102 extant species of didelphid marsupials occur in the New World. In several localities of French Guiana, a maximum of 12 species may occur in sympatry. These species belong to four lineages that

correspond with the subfamily Caluromyinae and the tribes Marmosini, Thylamini, Didelphini and Metachirini (in Didelphiane). Most species are locally abundant and occupy different strata in primary and secondary forests. Their phylogenetic affinities, as well as their habitat segregation, allow evaluating the role of compatibility and encounter filters in the structure of their infracommunities. The parasite fauna for six species consists of 21 species of digeneans, cestodes, nematodes and acanthocephalans. From these, four species of nematodes occur in relatively high prevalence and abundance in all species of marsupials. These include *Aspidodera raillieti*, *Trichuris reesali*, *Travassostrongylus paraquintus* and *Spirura guianensis*. Prevalence and abundance of concurrent species of helminths was significantly different, since some parasites were exclusively present in a maximum of two or three species of opossums. The analysis of prevalence and abundance using canonical multivariate analyses reveals a similar structure in the helminth infracommunities of syntopic species of opossums. The analyses of these values under a phylogenetic contrast, assist at determining that although the compound community may be essentially the same, the structure of the infracommunities correlates with the habitat segregation of the marsupials in the field.

Additional abstract inadvertently omitted from program.

Compatibility of *Fascioloides magna* miracidia and four snail species: miracidial chioce and snail response. **BRYAN ROLFSEN (GS)** and JEFF LAURSEN (MP), Department of Biological Sciences, Eastern Illinois University, Charleston, IL 61920

This study was designed to assess the factors involved in intermediate host finding and host-parasite compatibility in the deer liver fluke (*Fascioloides magna)*. The study used a panel of four sympatric snails (*Lymnaea caperata*, *Lymnaea elodes*, *Lymnaea exilis*, and *Physa* sp.) which display a range of susceptibility to the trematode; from *L. caperata* which is the natural intermediate host, to experimentally susceptible *L. elodes*, to resistant *L. exilis* and *Physa* sp. Miracidial host finding was tested by observing single miracidium infections for 30 min. time periods, to record number of contacts, attachment time, infection success, and whether the miracidium was harmed. Miracidia attached to susceptible *L. caperata* more often (x^2=6.6561, p=.0359) and for longer periods of time (x^2=8.5290, p=0.0141) than to resistant *L. exilis* or *Physa* sp. Miracidia exposed to a physid snail were harmed more often than those exposed to the lymnaeids (x^2=5.4000, p=0.0251). Subsequently, miracidia were exposed to snail mucus *in vitro* to assess its toxicity. Following the pattern seen with intact snails, mucus from *Physa* sp. was 100% toxic to miracidia, at 1:3 or 1:30 dilutions, within one hour compared to CBSS control. This effect decreased to 12.2% at 1:300 dilution. Mucus from *L. caperata, L. elodes, and L. exilis* showed no difference from CBSS for up to 4 hours. This study showed that miracidia do play an active role in locating and attacking a preferred host. However, the fact that mucus from *Physa* sp. served as a barrier to infection implied that snail components were at least as important in the host-parasite relationship.

Summary of the 63rd Annual Midwestern Conference of Parasitologists.

The 63rd Annual Midwestern Conference of Parasitologists was held on June 23-25, 2011, at Saint Mary's College in Notre Dame, Indiana. Dr. Shelly Michalski of The University of Wisconsin - Oshkosh served as Presiding Officer and Dr. Tom Platt of Saint Mary's College made local arrangements and served as Program Officer. Sixty persons registered for the conference. Nine platform presentations and 16 posters were presented. The C. A. Herrick Award and $300 for outstanding poster was awarded to Daniela Cortese of Rush University Medical Center and Universita di Torino for her poster "Hybrid praziquantel-oxadiazole oxides with activity against *Schistosoma mansoni*." The G. R. LaRue Award and $300 for outstanding platform presentation was awarded to Ablesh Gautam of the University of Kentucky for her presentation "Examination of the surface antigen (*SnSAG*)gene family in *Sarcocystis neurona*." Markah Frost and Sarah Johnston of Ohio Wesleyan University shared the R. M. Cable undergraduate award and $200 for their poster "Endoparasite survey in Bobcats (*Lynx rufus rufus*)from Ohio." Honorable Mention awards and $100 were given to Jenica Abrudan of the University of Notre Dame for a poster entitled "An in-depth analysis of the *Phlebotomus papatasi* transcriptome." and Elizabeth Warburton of Western Michigan University for her oral presentation "Relative roles of exposure and establishment in creating aggregated intestinal helminth burdens in *Eptesicus fuscus* (Chiroptera: Vespertilionidae). Ablesh Gautam was chosen as the AMCOP nominee for the American Society of Parasitologists' student travel grant award for 2012.

The AMCOP symposium was presented by Drs. Michael Ferdig and Mary Ann McDowell, both of the University of Notre Dame on the topic "Parasitomics". The banquet speaker was Dr. Bruce Christensen of the University of Wisconsin who spoke on "Programmes for control of lyphatic filariasis: perspectives of a vector biologist." The annual silent auction was also held.

AMCOP 64 will be held in 2012 at Truman State University in Kirksville, Missouri. Additional future meeting sites as determined by the Meeting Sites Committee are:

- AMCOP 65 – 2013: Purdue University, West Lafayette, IN
- AMCOP 66 – 2014: The University of Kentucky, Lexington KY
- AMCOP 67 – 2015: Lawrence University, Appleton, WI
- AMCOP 68 – 2016: Southern Illinois University, Carbondale IL

Secretary-Treasurer Woodmansee presented the treasurer's report for 2010 and the interim financial report for 2011. These were approved as was the report of the Auditing Committee.

At the business meeting the membership approved a minigrant program that is to last 3 years and then be evaluated. The general outline for the program is that 3 grants will be awarded each year, one for $500 and two for $250 to

support student research. Two grants will be awarded to undergraduate students and one to a graduate student. Awardees are to be members of AMCOP and are expected to present the results of their work at a future AMCOP. A student may not receive more than two grants. The current committee (S. Meagher, M. Bolek, A. Jimenez, T, Yoshino, K. Bates) will remain in place to work out final details and make the first call for proposals. It is anticipated that the first set of grants will be awarded sometime in 2012. The program will be funded out of the surplus funds that have accumulated in AMCOP's general account. The best presentation awards and the travel program will also continue.

The following committee reports were received and approved: Auditing (Andy Brittingham, Joe Camp), Symposium Suggestions (Katy Griffiths, Shelly Micahlski), Meeting Sites (Trudy Aebig, Ramon Carreno), Nominating (Daniel Howe, Agustin Jimenez), and Resolutions (Shawn Meagher, Lin Twining).

Officers elected for 2011 were: Dr. Shawn Meagher, Western Illinois University: Presiding Officer; Dr. Lin Twining, Truman State University: Program Officer. Dr. Douglas Woodmansee, Wilmington College: Secretary/Treasurer (2 year term).

Prepared June 28, 2011.
Douglas B. Woodmansee
AMCOP Secretary-Treasurer

REPORT OF THE AMCOP 63 RESOLUTIONS COMMITTEE
Shawn Meagher and Lin Twining

Whereas the 63rd Annual Midwestern Conference of Parasitologists met at St Mary's College, home of the Belle's, at Notre Dame, Indiana on June 23-25, 2011 and

Whereas the meeting was of the highest quality, promoting the field of parasitology as well as fellowship among those in attendance and

Whereas the membership of AMCOP wishes to sincerely acknowledge the contributions of the following individuals to the success of the 63rd annual conference,

Therefore be it resloved that we acknowledge with utmost thanks the following:

Dr. Tom Platt, Program Officer, for his meticulous planning that made for an incredilby successful conference,

Dr. Shelly Michalski, Presiding Officer, for her efficiency, grace, and good humor in conduction the meeting,

Our symposium speakers, Dr. Michael Ferdig and Dr. Mary Ann Mc Dowell, of Notre Dame University for their presentations on the parasitonomics of malaria and leishmaniasis,

Dr. Patricia Fleming, Vice President and Dean of Faculty, St. Mary's College for her welcoming remarks and enlightening research about the biggest and oldest parasites,

The American Society of Parasitologists for providing travel funds for our speakers,

Dr. Sam Loker, President Elect, The Amercian Society of Parasitologists for his greetings from the society and discussion of pertinent matters, including meeting sites and travel costs,

Dr. Bruce Christiansen, University of Wisconsin, for his excellent after banquet address, "Programmes for control of lymphatic filariasis: perspectives of a vector biologist".

Elanco Animal Health, a division of Eli Lilly Company, for its continued support of the C.A. Herrick Award for the outstanding poster session,

All AMCOP members, especially the students, who presented papers and posters, making the meeting an educational experience for all,

The members of AMCOP members who gleefully and without hesitation agreed to serve as Committee Members for this meeting,

The staff of St. Mary's dining services (Sodexo) for providing excellent servcie for the opening reception, continental breakfasts, refreshment break, and banquet,

St. Mary's science departments and staff for providing excellent facilities the presentations, poster session, and silent auction,

The membership of AMCOP for support of the G.R. La Rue Award for outstanding platform presentation, the Honorable Mention Awards, the Raymond Cable Award for outstanding undergraduate presentation, and travel awards for student winners,

Members of AMCOP who contributed books, journals, and esoterica for the silent auction, and finally,

Dr. Doug Woodmansee for continuing his fine job as our Secretary-Treasurer--as certified by the Auditing Committee.

THE ANNUAL MIDWESTERN CONFERENCE OF PARASITOLOGISTS (AMCOP)

OBJECTIVES AND ORGANIZATION

A restatement to incorporate changes approved in 1989. Earlier statements have been approved in 1948, 1953, 1971, 1972, 1973, 1974, 1986, 2003 and 2004.

NAME

The organization shall be known as the ANNUAL MIDWESTERN CONFERENCE OF PARASITOLOGISTS (AMCOP), hereinafter referred to as the Conference.

AFFILIATION

The Conference is an affiliate of the American Society of Parasitologists.

OBJECTIVES

The Conference is a gathering of parasitologists and students of parasitology for the purpose of informal discussion of research and teaching in parasitology and the furthering of the best interests of the discipline of parasitology.

MEMBERS

The Conference is open to all interested persons regardless of place of work, residence, or affiliation in other recognized societies. There are three categories of membership: Emeritus, Regular, and Student. When a member retires from industry, university or other professional occupation, that person shall be eligible for emeritus membership.

DUES

Annual dues are required for emeritus, regular and student membership. A registration fee is charged during registration at annual conferences. The amount of this fee will be decided for each Conference by a committee composed of the Presiding Officer, the Secretary/Treasurer, and the Program Officer, who is to serve as its chair. Dues are established by the Policy Committee and collected by the Secretary/Treasurer.

MEETINGS

The Conference is held in the general midwestern area during early to mid-June, unless otherwise specified by a majority vote of the previous Conference or a majority vote of those listed members replying by mail.

BYLAWS

1. Simple majority vote of members in attendance at regularly scheduled meetings of the Conference shall determine the policies of the Conference.

2. The officers are a Presiding Officer, whose term of office is one year or until a successor is elected (normally the term expires with adjournment of the annual Conference over which the person presides); a Secretary/Treasurer, whose term of office is two years or until a successor is elected; a Program Officer whose term of office is one year; and a Policy Committee composed of the last five available retired Presiding Officers plus, *ex officio* and without vote, the current Presiding Officer and Secretary/Treasurer. All terms of office of each full member of the Policy Committee is five years, or so long as the person is one of the five most recent, available Presiding Officers. The most recent past Presiding Officer available chairs the Policy Committee and is the Vice-President of the current Conference.

3. The Presiding Officer, the Secretary/Treasurer, and the Program Officer are elected by a majority vote of those members attending a regularly scheduled business meeting of the Conference or by a majority vote of those replying to a mail ballot of the membership.

4. The Presiding Officer shall preside at all meetings of the Conference and shall arrange for a banquet speaker. On the first day of a Conference the Presiding Officer shall appoint the following committees, which shall serve until they have reported on the last day of the annual Conference:

   (a) Nominating Committee,

   (b) Committee to Recommend Future Meeting Places,

   (c) Committee to Suggest Program Possibilities for Future Meetings,

   (d) Resolutions Committee,

   (e) Judging Committee,

   (f) Audit Committee,

   (g) such other *ad hoc* committees as may be required.

   The Presiding Officer shall appoint the Conference Representative to the Council of the American Society of Parasitologists for the year, who must

be a member of that society. The current Presiding Officer serves as a member without vote of the Policy Committee.

5. The Secretary/Treasurer shall issue annual dues notices and about four months prior to each Conference a call for participants in the program for each Conference; inform the new Presiding and Program Officers concerning their duties and the members of the Policy Committee of their tenure and the Secretary of the American Society of Parasitology within three weeks after the annual election; serve as member without vote and the Secretary of the Policy Committee: and supervise all funds of the Conference.

6. The Program Officer shall be responsible for the general format of the Conference and for arranging suitable facilities and funding. It shall also be this person's responsibility to chair the special committee to determine and collect the registration fee for the Conference. The format of the Conference may vary, but should include both a demonstration session and a session of contributed papers, both open to all members. A symposium may also be included or may replace a session of contributed papers.

7. The Policy Committee shall determine by majority vote all matters of procedure and policy pertaining to the Conference upon which decision must be reached between consecutive Conferences, as well as all matters referred specifically to it by the membership. Such a vote may be requested by any member of the Conference but must be directed through the Secretary/Treasurer. The Chairperson of the Policy Committee shall request approval by the membership for all decisions of the Committee at the earliest subsequent business meeting of the Conference.

8. The Conference confers three major awards during its annual meeting to student participants. These are the Chester A. Herrick Award, sponsored by the Eli Lilly Co., for the best poster/demonstration of parasitological research, the George A. LaRue Award for the best oral presentation of parasitological research, and the Raymond M. Cable Award for best presentation given by an undergraduate student. Honorable mention awards will be given to the second place poster/demonstration and second place oral presentation at the discretion of the awards committee. All awards except for the Herrick Award are supported by donations from the AMCOP membership.

9. (a) The winner of each award will be selected by a 3-person committee appointed at each annual meeting by the Presiding Officer. The criteria for judgment will be established each year by the committee.

(b) The size of the Herrick and LaRue awards shall traditionally be $300.00. The Cable undergraduate award and honorable mention awards shall traditionally be $100. Awards may vary according to funds available from contributors.

(c) No person may win the same award more than one time while in student status. Likewise, no student may win both awards at the same meeting. However, one person may win both awards while a student in different years.

SUMMARY OF AMCOP MEETINGS 1949-PRESENT

Year	Meeting Site (Conference No.)	Presiding Officer
Banquet Speaker & Title, PO=Program Officer, ST=Secy/Treas, H=Herrick Award, L=LaRue Award, HM=Honorable Mention, C=Cable Undergraduate Award; S=Symposium Title and Speakers		
1949	Univ. Wisconsin, Madison, WI (AMCOP I) J.C. Baer, ST=J. R. Lincicome	Harley J. VanCleave
1950	Univ. Michigan, Ann Arbor, MI (II) W.W. Cort, Trends in Helminthological Research. PO/ST=R. J. Porter	R.V. Bangham
1951	Purdue University, Lafayete, IN (III) J.E. Ackert, Some Observations on Hookworm Disease. ST=W. Balamuth	L.O. Nolf
1952	Univ. Illinois, Urbana, IL (IV) A.C. Walton, ST=W. Balamuth	R.J. Porter
1953	Iowa State College, Ames IA (V) R.M. Cable, Parasitological Experiences in Puerto Rico. ST=W.D. Lindquist	C.A. Herrick
1954	Michigan State Univ., East Lansing, MI (VI) G.F Otto, Mosquitos, Worms, Somoans and the Parasitologist in Somoa. ST=W.D. Lindquist	A.C. Walton
1955	Notre Dame Univ., IN (VII) G.R. LaRue, Relationships in the Development of Digenetic Trematodes. ST=W.D. Lindquist	R.M. Cable
1956	Iowa State University, Ames, IA (VIII) W.H. Headlee, ST=F.J. Krudenier	W.D. Lindquist
1957	Univ. of Michigan, Ann Arbor, MI (IX) A.C. Chandler, ST=F.J. Krudenier	J.E. Ackert
1958	Kansas St. Univ., Manhattan, KS (X) H.W. Manter, Trematodes of Many Waters. ST=F.J. Krudenier	G.R. LaRue
1959	Northwestern Univ., Evanston, IL (XI) H. Van der Schalie, Contrasting Problems in Conrol of Schistosomiasis in Egypt and the Sudan. ST=D.T. Clark	G.F. Otto
1960	Purdue Univ., Lafayette, IN (XII) P.P. Weinstein, Aspects of Growth and Differentiation of Parasitic Helminths *in vitro* and *in vivo*. ST=D.T. Clark	F.J. Krudenier
1961	Ohio State Univ., Columbus, OH (XIII) B. Schwartz, Parasitology Old and New. ST=D.T. Clark	N.D. Levine
1962	Univ. of Nebraska, Lincoln, NE (XIV) O.W. Olsen, The Life History of the Hookworm of Fur Seals. ST=D.T. Clark	G.W. Kelley, Jr

1963 Univ. of Minnesota, St. Paul, MN (XV) M.F. Hansen
F.G. Wallace, Observations on the Louisiana State University Inter-American Program in Tropical Medicine. ST=D.T. Clark

1964 Univ. of Chicago, Chicago, IL (XVI) D.T. Clark
R.E. Kuntz, Paragonimiasis in Formosa. ST=E. J. Hugghins

1965 Kellogg Biological Station, Gull Lake, MI (XVII) P.E. Thompson
L. Jacobs, Toxoplasmosis. ST=E.J. Hugghins

1966 Univ. of Illinois, Urbana, IL (XVIII) M.J. Ulmer
D.L. De Guisti, The Acanthocephala. ST=E.J. Hugghins

1967 Iowa State Univ., Ames, IA (XVIV) P.J. Silverman
N.D. Levine, Parasitology, Problems and Promise. ST=E.J. Hugghins H=P.M. Nollen [FIRST HERRICK AWARD]

1968 Univ. of Wisconsin, Madison, WI (XX) F.G. Wallace
D.R. Lincicome, The Goodness of Parasitism. (with APS & AIBS) ST=J.H. Greve, H=W.G. Barnes

1969 Univ. of Cincinnati, Cincinnati, OH (XXI) H.W. Manter
H.W. Stunkard, Life Histories and Systematics of Parasitic Flatworms. ST=J.H. Greve, H=B. Caverny, H=T.P. Bonner

1970 Loyola Univ., Chicago, IL (XXII) J.L. Crites
M.J. Ulmer, Helminths from Midwest to Mediterranean. ST=J.H. Greve, H=H. Blankespoor

1971 Univ. of Louisville, Louisville, KY (XXIII) F. Etges
H. Van der Schalie, Dam Large Rivers-Then What? ST=J.H. Greve, H=R. Campbell

1972 Southern Illinois Univ., Carbondale, IL (XXIV) B.J. Jaskowski
R.M. Cable, The Lighter Side of Parasitology. PO=T.T. Dunagan, ST=J.H. Greve, H=E.M. Cornford

1973 Notre Dame Univ., Notre Dame, IN (XXV) R. Shumard
R.F. Rick, Babesiosis and the Development of *Babesia* in Ticks. PO=R. Thorson, ST=J.H. Greve, H=D. Danley

1974 Univ. of Michigan, Ann Arbor, MI (XXVI) D. Ameel
M.J. Ulmer, Snails, Swamps and Swimmer's Itch. ST=J.H. Greve, H=P.T. LaVerde and D. Prechel

1975 Iowa State Univ., Ames, IA (XXVII) W. Bemrick
P.M. Nollen, Studies on the Reproductive Systems of Parasitic Flatworms or All You Wanted to Know About Sex in Worms and Were Afraid to Ask. ST=J.H. Greve, H=D. Wittrock, L=V.M. Nelson [FIRST LARUE AWARD]

1976 Univ. of Nebraska, Lincoln, NE (XXVIII) J. Greve
A.C. Todd, A Redefinition of Subclinical Parasitism and its Impact on World Politics. ST=W.H. Coil, PO=M.H. Pritchard, H=W.L. Current, L=C.A. Klu

1977 Kansas State Univ., Manhattan, KA (XXIX) T.T. Dunagan
A.J. MacInnis, Snails, Dollars, DNA and Worms. PO=W.D. Lindquist, ST=W.H. Coil, H=M. Fletcher, L=L. Smurro, L=J. Ketchum

1978 Indiana Central Univ., Indianapolis, IN (XXX) E.J. Hugghins
J.P. Dubey, Recent Advances in Feline and Canine Coccidia and Related Organisms. PO=M. Brandt, ST=W.H. Coil, H=D. McNair, L=G.L. Hendrickson

1979 Loyola Univ., Chicago, IL (XXXI) D.E. Gilbertson
E. Foor, Basic Studies in Reproduction (in Nematodes). PO=B.J. Jaskowski, ST=W.H. Coil, H=G. Plorin, H=D. Minchella, L=M. Fletcher

1980 Eastern Michigan Univ., Ypsilanti, MI (XXXII) A.D. Johnson
J.R. Williams, Tropical Parasitiology at the Junction of the White and Blue Nile Rivers. PO=E. Waffle, ST=G. Garoian, H=C.L. Williams, L=M. Goldman, L=R. Gamble, S=Functional Morphology of Acanthocephala

1981 Eastern Illinois Univ., Charleston, IL (XXXIII) D.M. Miller
G.D. Cain, Antigenic Variation: New Techniques Applied to Old Problems. PO=B.T. Ridgeway, ST=G. Garoian, H=J.M. Holy, L=B.N. Tuggle, S=Immunity to Protozoan Parasites

1982 Western Illinois Univ., Macomb, IL (XXXIV) D.G. Myer
J.D. Briggs, Biological Control of Invertebrates in International Programs. PO=P.M. Nollen, ST=G. Garoian, H=D.E. Snyder, L=C.L. Williams, S=Biological Control of Organisms

1983 Univ. of Illinois, Urbana, IL (XXXV) C.M. Vaughn
H.M. Moon, Speculations on the Pathogenesis of Cryptosporidiosis with Comparisons to Other Enteric Infections. PO=K.S. Todd, Jr, ST=G. Garoian, H=K.J. Hamann, L=K.W. Bafundo, S=Intestinal Protozoa

1984 Univ. of Iowa, Iowa City, IA (XXXVI) W.H. Coil
J. Donelson, Genetic Rearrangement and the Basis of Antigenic Variation in African Trypanosomes. PO=G.D. Cain, ST=G. Garoian, H=K.F. Forton, L=D. Woodmansee, S=Helminth Immunology

1985 Ohio State Univ., Columbus, OH (XXXVII) B.T. Ridgeway
K.D. Murrell, Epidemiology of Swine Trichinosis: Could Both Zenker and Leuckart be Right?, PO=P.W. Pappas, ST=G. Garoian, H=R.L. Lavy, L=H.K. Forton, S=Physiological Ecology of Parasites

1986 Univ. of Missouri, Columbia, MO (XXXVIII) G.D. Cain
R.C. Tinsley, Correlation of Host Biology in Polystomatid Monogenea. H=M.C. Lewis, H=I.G. Welsford, L=D.A. Leiby, PO=L. Uhazy, ST=D.M. Miller, S=Gene Expression in Helminth Development

1987 Southern Illinois Univ., Edwardsville, IL (XXXIX) P.M. Nollen
K. Kazacos, *Baylisascaris* Nematodes-Their Biology and Role in Larva Migrans Disease. PO=D. Myer, ST=D.M. Miller, H=D.A. Leiby, L=V.A. Conners, S=Modern Systematics in Parasitology

1988 Purdue University, West Lafayette, IN (XL) G. Garoian
W.H. Coil, Forty Years of AMCOP, Laying a Foundation. PO=K. Kazacos & D. Minchella, ST=D.M. Miller, H=R.A. Bautz, L=R.R. Mitchler, S=Host Parasite Genetics

1989 Miami Univ., Oxford, OH (XLI) A.E. Duwe
G. Castro, A Physiological View of Host-parasite Interactions. PO=R.A. Grassmick, ST=D.M. Miller, H=S.R. Morris, S=Parasites in the Immune Suppressed, Special Visit by President Kemp of ASP.

1990 Univ. Illinois, Urbana, IL (XLII) J. H. Hubschman
G. Cross, Phosphatidylinositol Membrane Anchor and/or Transfection of Protozoa. PO=G. McLaughlin, ST=D.M. Miller, H=L.D. Morton, L=S.R. Morris, S=Defining the Limits of Integrated Pest and Disease Management.

1991 University of South Dakota, Vermillion, SD, (XLIII) K. R. Kazacos
M. Dryden, What You Always Wanted to Know About Fleas on Fluffy and Fido but were Afraid to Ask. PO=A. D. Johnson, ST=D.M Miller, H=D. Royal, L=R. Clopton, S= Host Specificity

1992 Univ. Wisconsin-Eau Claire, WI, (XLIV) Omer Larson
PO=D. Wittrock, ST=D.M.Miller, H=S. Storandt, L=D. K. Howe, S=Teaching of Parasitology-New Methods; Visit by ASP President J. Seed

1993 St. Mary's, Notre Dame, IN, (XLV) R. A. Grassmick
J. Crites, AMCOP Peragrare Anni, Homines, Exitus
PO=T.R Platt, ST=D.M.Miller, H=M. S. Schoen, L=B. J. Davids, S="Ain't Misbehavin'": Ethology, Phylogeny and Parasitology

1994 Murray State Univ. Murray, KY (XLVI) Gary Uglem
E. Christiansen, Come out, come out, we know you are in there
PO=L. Duobinis-Gray, ST=D. J. Minchella, H=J. Rosinski,
L=R. Garrison, S=Parasite Ecology: Population and Community Dynamics

1995 Univ. of Wisconsin-Milwaukee (XLVII) Darwin Wittrock
E.S. Loker, Schistosomiasis in Kenya: a Copernican point of view
PO= J. Coggins, ST=D.J. Minchella; H=J. Curtis; L=M. Dwinnell
S=Water-borne Diseases

1996 Northeast MO State Univ., Kirksville, MO (XLVIII) Daniel Snyder
PO=L. C. Twining, ST=D.J. Minchella, H= V. G. Mehta, L=H. Yoder,
S=Immune Aspects of Protozoan Infections: Malaria and Amoebiasis

1997 Butler University, Indianapolis, IN, (XLIX) Joe Camp
R. Hengst, Paleoparasitology, PO=D. Daniell; ST=D.J. Minchella;
H=A. Bierberich, L=S. Kappe, S=Molecular Biology in Solving
Problems in Parasitology

1998 Indiana State University, Terre Haute, IN (L) Jim Coggins
W. Coil, J. Crites, & T. Dunagan, AMCOP 50 - Fifty Years Revisited;
PO=F. Monroy & D. Dusanic; ST=D. Wittrock; H=M. Bolek; L=K. Page
S= Cytokines and Parasitic Diseases; Visit by ASP President John Oaks

1999 Wilmington College, Wilmington OH (LI) Dennis Minchella
P. LoVerde, Molecular Biology of Schistosomes, PO= D. Woodmansee,
ST=D. Wittrock; H= J.B.Green; L=J. Curtis; S=Parasite Biochemistry by
J.D. Bangs and C.F. Fioravanti.

2000 University of Notre Dame, Notre Dame, IN (LII) Peter Pappas
J.A. Oaks – Zen and the Art of Tapeworms
PO= J. H. Adams; ST= D. Wittrock; H= A. Eppert; L= M. Bolek;
HM= C. Dresden-Osborne & K. VanBuskirk
S=Life Style Choices of Parasitic Protozoans by T. Sinai and J. Lebowitz

2001 Eastern Illinois University, Charleston, IL (LIII) Lin Twining
R.D. Smith - Environmental contamination with *Cryptosporidium*
parvum from a dairy herd. PO= J. Laursen; ST= D. Wittrock;
H= B. Foulk; L= M. Michalski ; HM= M. Gillilland III; B. Balu
and P. Blair S= Use of Molecular Data in Parasite Systematics by M. Mort
and M. Siddall

2002 Millikin University, Decatur, IL (LIV) David Williams
P. Brindley – Mobile genetic elements in the schistosome genome
PO=Tom McQuistion; ST= D. Wittrock; H= Stacy Pfluger; L= Greg
Sandland; HM= Kelly VanBuskirk and Michelle Steinauer
S= Parasite Transmission and Control in Domesticated Animals by
M. McAllister and L. McDougald

2003 Michigan State University, East Lansing (LV) Tom Platt
Robert Pennock – Darwin and the Parasitic Wasp: Teaching Evolutionary
Design; PO= Pat Muzzall; ST= Darwin Wittrock; H= Luis Gondim;
L= Michelle Steinauer; HM= Shawna Cook and Ahmed Sayed;
C= Katie Reif; S= Vector Borne Diseases of Michigan and Adjacent States
by Ned Walker and Hans Klompen

2004 Minnesota State University, Mankato, MN (LVI) Patrick Muzzall
Richard Clopton – Publishing with pain: The editor doesn't really hate you.
PO= Robert Sorensen, ST= Darwin Wittrock; H=Rebecca LaBorde;
L= Maria Castillo; HM= Angie Kuntz and Laura Duclos; C=Jenna Rodgers
S= Molecular phylogenetics of parasites by Vasyl Tkach and
Ramon Carreno

2005 Wabash College, Crawfordsville, IN (LVII) Douglas Woodmansee
John Adams - In a changing world of malaria research, can an old dog learn new tricks? PO= Eric Wetzel, ST= Darwin Wittrock; H= Amy McHenry; L= Laura Duclos; HM= Jillian Detwiler and Julie Clennon; C= Kristin Giglietti; S= Molecular Phylogenies in Nematoda by Virginia Ferris and Microbial Community Ecology of Tick-borne Human Pathogens by Keith Clay

2006 Winona State University, Winona, MN (LVIII) Thomas McQuistion
Matthew Bolek - Amphibian parasites: The cool, the bad and the ugly. PO= Kim Bates; ST= Doug Woodmansee; H= Andrew Claxton; L= Kristin Herrmann; C= Lindsey Stillson; HM= Brenda Pracheil, Kristin Giglietti; S= Parasites of Wildlife of the Midwest by Rebecca Cole and Darwin Wittrock

2007 University of Wisconsin-Oshkosh, Oshkosh, WI (LIX) Jason Curtis
David Williams – The Genomics Revolution in Parasitology. PO= Shelly Michalski, ST= Doug Woodmansee; H= Christine Hsiao; L= Shriveny Dangoudoubiyam HM= Peter Ziniel, Nathan Peterson; C= Emily Doucette, S= Tropical Disease by Gary Weil and Peter Fischer

2008 University of Illinois at Urbana-Champaign (LX) Robert Sorensen
Dennis Minchella – P.C. (Post Cable) Parasitology at Purdue.PO= Milton McAllister, ST= Doug Woodmansee; H= Nathan Peterson; L= Erica Mize HM= Apichat Vitta, Jillian Detweiler; C= Kyle Luth, S= Parasitic Protists by Laura Knoll and Alexa Rosypal.

2009 Ohio Wesleyan University, Delaware, OH (LXI) Daniel Howe
Eugene Lyons - Hookworms (*Unicaria* spp.) in Pinnipeds with Notes on the Biology of Northern Fur Seals. PO= Ramon Carreno, ST= Doug Woodmansee; H= Sriveny Dangoudoubiyam; L= Elizabeth Thiele, HM= Matthew Brewer; C= Cailee Smith; S= Ectoparasites by Susan C. Jones and Glen R. Needam

2010 Western Illinois University, Macomb, IL (LXII) Jeffrey Laursen
Tim Yoshino - Frankenflukes: Parasitic GMO's. PO= Shawm Meagher, ST=Doug Woodmansee; H=Kathryn Coyne; L=Philip Scheibel; HM= Kathy Johnson; C= Bryan Rolfsen; S= Can Parasitic worms treat autoimmune disorders? by David Elliott and John O. Fleming.

2011 Saint Mary's College, Notre Dame IN (LXIII) Shelly Michalski
Bruce Christensen – Programmes for control of lymphatic filariasis: perspectives from a vector biologist. PO= Tom Platt, ST= Doug Woodmansee; H=Daniela Cortese; L=Ablesh Gautam HM= Jenica Abrudan, Elizabeth Warburton; C= Markah Frost, Sarah Johnson; S=Parasitonomics by Mary Ann McDowell and Mike Ferdig.

2012 Truman State University, Kirksville, MO (LXIV) Shawn Meagher
Scott D. Snyder - Parasite Biodiversity: Reflections, Challenges and Opportunities. PO=Lin Twining , ST= Doug Woodmansee; H=?; L=? HM= ?; C= ?; S=Patricia Parker and John Janovy.

2013 Purdue University, West Lafayette, IN (LXV)
PO=Joe Camp , ST= Doug Woodmansee; H=?; L=? HM= ?; C= ?; S=?

	2011 AMCOP Financial Report				
	Final				
Cash on Hand 1/1/11				**$4,977.55**	
Expenses					
	AMCOP 63 Program Duplication	$251.78			
	Postage	$11.84			
	Certificates & Holders	$53.46			
	Herrick Award	$300.00			
	LaRue Award	$300.00			
	Cable Award	$200.00			
	Honorable Mention Awards	$200.00			
	Bank Fees	$0.00			
	Office Supplies	$0.00			
	Speaker Expenses	$0.00			
	2010 Student Travel Awards	$400.00			
	2011 Student Travel Awards	$0.00			
	Web Site Expense	$0.00			
	Total Expenses			**$1,717.08**	
Income					
	2011 Dues Payments	$425.00			
	2011 Member Contributions	$400.00			
	Lilly Donation	$300.00			
	ASP Support	$250.00			
	Silent Auction Revenue	$27.00			
	Interest Income	$152.41			
	AMCOP 63 Surplus (Loss)	$661.34			
	Total Income			**$2,215.75**	
Cash on Hand 12/31/12				**$5,476.22**	
Operating Surplus (Loss) for 2011					**$ 498.67**
Value of CD (as of 5/12/2011)				**$7,017.25**	
Current Net Worth				**$12,493.47**	
			Submitted By:		
Financial Report Approved by 2012 Auditing Committee:			Douglas B. Woodmansee		
			Douglas B. Woodmansee		
_____			**Secretary/Treasurer**		

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(Dues Paid in Either 2011 or 2012)

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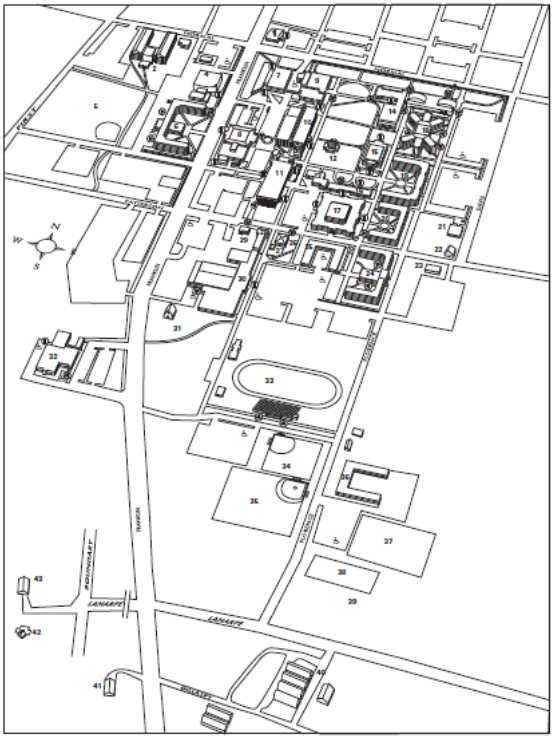
Peter Ziniel Rush University Medical Center peter_ziniel@rush.edu	

MAP



TRUMAN
STATE UNIVERSITY

1 Ruth W. Towne Museum & Visitors Center
2 West Campus Suites
3 Public Safety
4 Student Recreation Center
5 Student Recreation Field
6 Centennial Hall
7 McClain Hall
8 Student Union
9 Baldwin Hall
10 Pickler Memorial Library
11 Magruder Hall
12 Kirk Memorial
13 Power Plant
14 Ophelia Parrish
15 Kirk Building
16 McKinney Center
17 Violette Hall
18 Missouri Hall
19 Blanton-Nason-Brewer Hall
20 Dobson Hall
21 Randolph Apartments
22 University Mail Services
23 University Club House
24 Ryle Hall
25 Fair Apartments
26 Adair Building
27 Adair Annex
28 E.C. Grim Hall
29 University Counseling Services
30 Pershing Building
31 Red Barn Park
32 Barnett Hall
33 Stokes Stadium & Gardner Track
34 Softball Field
35 Baseball Field
36 Campbell Apartments
37 Soccer Field
38 Tennis Courts
39 Athletic Field
40 Baldwin-Delaney Buildings
41 Truman State University Press
42 Observatory
43 University Farm

Handicapped Parking
Automatic Handicap Access
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KIRKSVILLE
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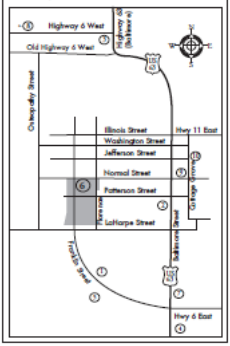
660.665.8352 • 800.301.2772
2. Budget Host Village Inn
660.665.2722
3. Comfort Inn
660.665.2205 • 800.424.6423
4. Days Inn
660.665.8244 • 800.329.7466
5. Holiday Inn Express Hotel & Suites
800.Holiday • 660.627.1100
6. Truman State University
7. Super 8 Motel
660.665.8816 • 800.800.8000
8. Thousand Hills State Park Cabins
660.665.7179 • 800.334.6946
9. Brashear House B&B
660.627.2078
10. Cottage Grove B&B
660.627.4444



NOTES

NOTES

2012 AMCOP DUES

Name _____

Address _____

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Phone #_____

Email _____

DUES
Faculty & Emeriti ($10), Student ($5): $_____

CONTRIBUTION to student awards:
$_____

TOTAL $_____

****
Please make checks payable to AMCOP.
****

Send this form and your check via US Mail to:

Dr. Douglas Woodmansee
AMCOP Secretary/Treasurer
Pyle Center Box 1263
Wilmington College
1870 Quaker Way
Wilmington, OH 45177

This form also available at
www.amcop.org