



Center for Tropical & Emerging Global Diseases

UNIVERSITY OF GEORGIA



Director's Corner

Earlier this summer Professor Michael R. Strand was elected to the National Academy of Sciences. This honor is considered one of the most prestigious that a scientist can achieve in his or her career. Mike, a Professor of Entomology and long time member of the Center for Tropical and Emerging Global Diseases is only the 8th member of the National Academies from UGA. This could not have happened to a more deserving person. Mike truly exemplifies what is possible when one dedicates his time and effort to the pursuit of science. Despite his achievements Mike remains humble and dedicated to his team of colleagues, staff, and students. This is a very proud moment for Mike, the CTEGD, and the University of Georgia!



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Our Mission: To pursue cutting edge research on tropical and emerging diseases, train students in this field and effectively tackle global diseases of poverty.

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Cover image description:

Top, left to right: developing eggs from the ovary of the parasitic wasp *Microplitis demolitor*, image by Kandasamy, Biomedical Core Facility; Paul D. Coverdell Center for Biomedical Research; Angel Padilla, assistant research scientist in Rick Tarleton's lab prepares samples, photo by Donna Huber.

Bottom, left to right: women in Africa, photo by Julie Moore; mosquito; South American children; *Trypanosoma brucei*, image courtesy of Roberto Docampo.



UGA Entomologist Elected to National Academy of Sciences

by Sam Fahmy

Photo by Dorothy Kozlowski

Michael R. Strand has received one of the highest honors a scientist can receive—election to the National Academy of Sciences.

Strand, who holds an appointment in the entomology department of the College of Agricultural and Environmental Sciences and an affiliated appointment in the genetics department of the Franklin College of Arts and Sciences, is UGA's eighth member of the National Academies, which include the National Academy of Sciences, National Academy of Engineering and National Academy of Medicine.

“The University of Georgia commends Dr. Strand on this most prestigious recognition,” said President Jere W. Morehead. “Dr. Strand’s influential research is representative of the high caliber of faculty at UGA and the strength of our growing research enterprise. It is an honor to have him represent this university in an organization of such tremendous national importance.”

Strand’s primary research interests are in the study of the interactions among insects, parasites and microorganisms. Applications of his work focus on insects that are important to agriculture and that transmit human diseases such as malaria and Zika virus. His work has garnered nearly \$28 million in external funding from agencies such as the National Institutes of Health, U.S. Department of Agriculture and National Science Foundation. He has published more than 220 research papers, and his findings have been cited at a level that places him in the top 1 percent of entomologists and among the top 5 percent in the fields of biology and biochemistry.

“Dr. Strand’s work underscores the profound impacts that basic science can have on agriculture and human health,” said Senior Vice President for Academic Affairs and Provost Pamela Whitten. “He exemplifies the kind of world-changing research and instruction that make the University of Georgia one of the nation’s leading public universities.”

Strand’s expertise is sought around the globe. He has delivered invited seminars and symposia in nearly every depart-

ment of entomology in the United States and at universities and conferences in Europe, Asia, South America, Africa, and Australia. In Athens, he has taught undergraduate survey courses in entomology and has mentored more than 50 doctoral students and postdoctoral fellows who have gone on to careers in government, industry and academia.

Strand has earned several honors over the course of his career, including being named a Fellow of the American Association for the Advancement of Science and of the Entomological Society of America. In 2013, he was named Regents’ Professor, an honor bestowed by the Board of Regents of the University System of Georgia to distinguished faculty whose scholarship or creative activity is recognized both nationally and internationally as innovative and pace setting.

He joined the UGA faculty in 2001 and is a member of the university’s Center for Tropical and Emerging Global Diseases and its Faculty of Infectious Diseases. He earned his bachelor’s degree and Ph.D. from Texas A&M University and was a postdoctoral researcher at Imperial College London.

The National Academy of Sciences is a private, nonprofit institution that was established under a congressional charter signed by President Abraham Lincoln in 1863. It recognizes achievement in science by election to membership, and—with the National Academy of Engineering and the National Academy of Medicine—provides science, engineering and health policy advice to the federal government and other organizations.

Professor Elected to the Latin American Academy of Sciences

Roberto Docampo, the Barbara and Sanford Orkin Eminent Scholar, was elected as a corresponding member of the Latin American Academy of Sciences. The Academy was created in 1982 under the sponsorship of the Pontifical Academy of Sciences and promotes and contributes to the advancement of mathematical, physical, chemical, earth, and life sciences, and to their application to the development and integration of Latin America and the Caribbean.

New Project Funded: A Tool for *Cryptosporidium* Research

by Donna Huber



Sumiti Vinayak, an assistant research scientist in Boris Striepen's laboratory, has been awarded a Bill & Melinda Gates Foundation Grand Challenges Explorations Grant to develop a tool to study the function of essential genes in *Cryptosporidium*.

Cryptosporidium is the second leading cause of life-threatening diarrhea and developmental stunting in young children worldwide. The only FDA-approved drug treatment, Nitazoxanide, has limited effectiveness and in young children or immunocompromised patients, there is little to no relief provided by the medication.

Cryptosporidium is difficult to study in the laboratory which has limited the search for better treatment of the disease. The Striepen laboratory has been successful in transforming *Cryptosporidium* into a genetically modifiable organism and, thus, removing a major hurdle to drug discovery.

"Currently, there are no tools available for *Cryptosporidium* to conditionally regulate gene or protein function and determine their role in the parasite," said Vinayak. "The goal of this project is to develop a powerful conditional protein degradation tool that will allow us to obtain data on the biological function of essential proteins in *Cryptosporidium parvum* and accelerate the drug discovery process."

In this project, Vinayak will build on her molecular genetics work to develop a tool that will allow assessment of genes essential for parasite survival. The tool developed in this project will use a plant photoreactive protein and blue light to shut off the expression of a specific, targeted protein in the parasite.

This tool will make the validation of drug targets possible in *Cryptosporidium*, a key next step in the discovery of better treatment for a disease that results in an estimated 748,000 cases each year in the United States alone.

Other projects funded

Chris West and his colleagues at the State University of New York at Buffalo received NIH funding for their project on control of *Toxoplasma gondii* growth by the host cell transcription factor HIF1.

Jessie Kissinger and her colleagues at the University of Pennsylvania received funding from the Bill & Melinda Gates Foundation to build databases to house the data emerging from Gates Foundation global enteric disease studies.

Roberto Docampo and his collaborators from the State of Minas Gerais in Brazil were awarded a FAPEMIG-UGA Mobility Grant to support collaborative research between investigators at UGA and institutions of Science, Technology, and Innovation located in State of Minas Gerais to support preliminary research, mobility, and proposal preparation undertaken in pursuit of specific sources of external funding.

Adrian Wolstenholme received funding from the American Heart Association for genome-wide association studies of macrocyclic lactone resistance in canines.

Bioinformatics Professor Named Distinguished Research Professor

Jessica Kissinger is a globally recognized molecular biologist and world expert in bio-computational research whose contributions to the field of eukaryotic pathogen research have helped transform how pathogen research is conducted internationally.



As an expert on the evolution of parasite genomes, she conducted the first systematic survey of gene transfer in the Apicomplexa, upending prevailing thought. Her subsequent series of paper on the Apicomplexa also opened a new window into genome evolution and the biology of several other important disease-causing organisms.

Her most recognized and sustained contribution to science has been the co-creation, maintenance and enhancement of integrated omics tools to facilitate research on eukaryotic pathogens. The databases and program resources have been designated an NIH Bioinformatics Resource Center.

Recent Graduates

Phil Yao, Ph.D. (Tarleton) is finishing his medical degree at Augusta University Medical School.

Kerri Coon, Ph.D. (Strand) has taken a post-doc position at University of Texas-Austin.

Kazi Rahman, Ph.D. (West) has taken a post-doc position with Alex Compton at NIH.

Catherine Sullenberger (Mensa-Wilmot) has taken a post-doc position at the National Cancer Institute in Maryland.

Justin Fellows, Ph.D. (Striepen) has taken a post-doc position at NIH.

Mary Maclean (Wolstenholme)

Field Research

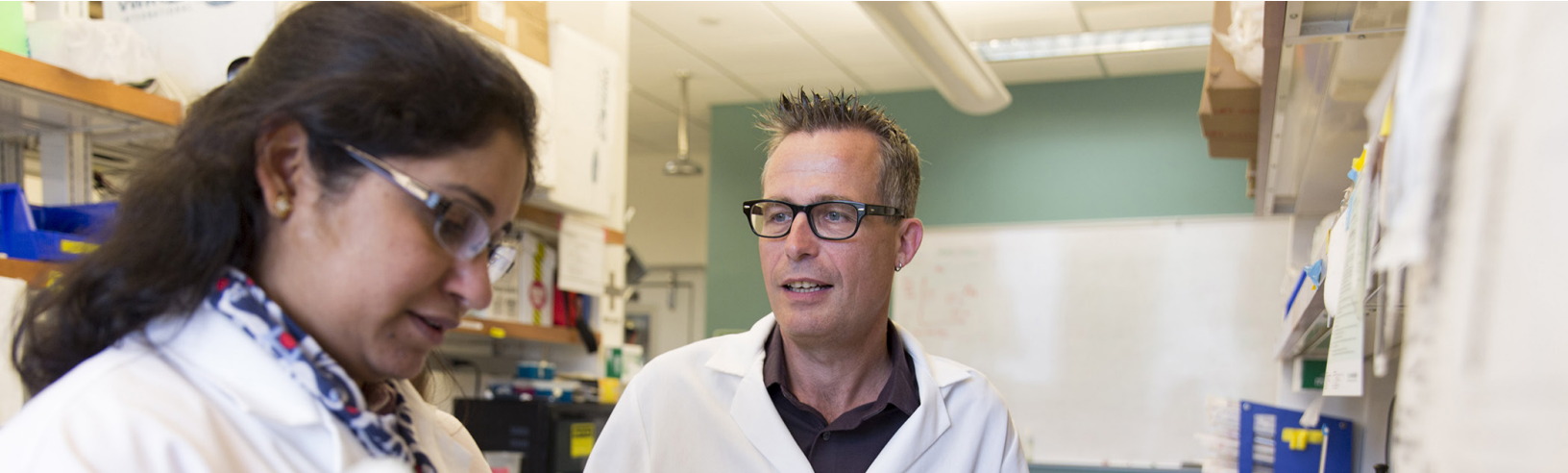
Steven Maher, as assistant research scientist in Dennis Kyle's lab, traveled to the Netherlands, Thailand, Cambodia, and Brazil to meet with collaborators.

Daniel Colley joined a team from the CDC and the Pan American Health Organization to participate and advise on a survey on the island nation of St. Lucia. The purpose of the survey was to determine if there is still schistosomiasis being transmitted on St. Lucia. Schistosomiasis was very bad on St. Lucia in the 1970s when Dan previously did research there.



It appears that this disease is greatly diminished on St. Lucia now and this might be a perfect location to see if it can actually be eliminated and that elimination be documented sufficiently for verification by the WHO. The specimens collected are now being analyzed in Dan's laboratory at UGA and by his collaborator at CDC.

Photo: Dan buying research equipment in St. Lucia



Researchers Report Milestone in Global Fight Against a Major Cause of Diarrheal Disease

by Allyson Mann

Photo by Andrew Davis Tucker

Infectious disease scientists have reported the discovery and early validation of a drug that shows promise for treating cryptosporidiosis, a diarrheal disease that is a major cause of child mortality and for which there is no vaccine or effective treatment.

“Cryptosporidiosis is largely a disease of poverty,” said Boris Striepen, Distinguished Research Professor of Cellular Biology in UGA’s Franklin College of Arts and Sciences and a member of the Center for Tropical and Emerging Global Diseases. “Globally, it primarily affects infants in developing countries, but there are patients in the U.S.-those with weakened immune systems, such as HIV/AIDS or transplant patients-that would benefit greatly from new therapeutics.”

Striepen began studying crypto, as researchers often call the parasite that causes cryptosporidiosis, more than a decade ago. Now he and assistant research scientist Sumiti Vinayak, along with scientists at Novartis and Washington State University, have reported the discovery of KDU731, a potent inhibitor of *Cryptosporidium*, in the journal *Nature*.

Identifying KDU731 as a potential drug for the treatment of cryptosporidiosis began with the screening of a selection of 6,200 compounds that showed strong activity against the related malaria parasite. The Novartis team identified compounds with activity against crypto and found KDU731 particularly promising based on preclinical data.

Using a new mouse model, Striepen and Vinayak showed that oral treatment with the drug dramatically reduced intestinal infection of immunocompromised mice. Additional research at Washington State University showed that treatment with KDU731 also leads to rapid resolution of diarrhea and dehydration in neonatal calves, a clinical model of cryptosporidiosis that closely resembles human infection.

Crypto is most commonly spread through tainted drinking or recreational water. When a person drinks contaminated water, parasites emerge from spores and invade the cells that line the small intestine, causing severe diarrhea that can last for up to three weeks.

In 1993, more than 400,000 people living in the Milwaukee, Wisconsin, area were infected and became ill when one of the city’s water treatment systems malfunctioned. More than 100 people, mostly AIDS patients, died during the outbreak.

Outbreaks have also been linked to swimming pools and water parks. Crypto is the most common cause of diarrheal illness and outbreaks linked to recreational water because it is not

easily killed by chlorine and can survive up to 10 days in properly treated water.

The Centers for Disease Control and Prevention reported at least 32 outbreaks in U.S. facilities during 2016-twice as many as in 2014, according to preliminary data in the agency’s May 18 Morbidity and Mortality Weekly Report.

Recent global studies have shown crypto to be one of the most important causes of life-threatening diarrhea in infants and toddlers, especially in areas that lack access to clean water. The only drug approved by the U.S. Food and Drug Administration is nitazoxanide, but it provides no benefit for those in gravest danger - malnourished infants and immunocompromised patients.

Crypto is notoriously difficult to work with in a laboratory setting, but Striepen has developed new genetic techniques that make it easier to detect and follow the parasite. One technique involves manipulating crypto so that it emits light and is easier to detect and measure. For this study, Striepen’s team engineered a new “reporter” parasite that is amenable to whole-animal imaging, allowing the researchers to non-invasively track and record dissipation of the infection during treatment.

Striepen’s genetically modified organisms have been made available to researchers across the world in the hope that more scientists will be drawn to studying crypto.

“This is an important problem,” he said. “No one institution can solve it alone. It needs significant investment, and it needs a lot of people with good ideas.”

“The discovery of this compound represents an important step toward urgently needed treatment for gravely ill children around the world,” said Thierry Diagana, head of the Novartis Institutes for Tropical Diseases.

An online version of the study is available at <http://dx.doi.org/10.1038/nature22337>.

Roberto Docampo and his collaborators were awarded a US patent (US 9,597,375 B20) entitled “Coagulation and fibrinolytic cascades modulator”.



SCORE Hosts 7th Annual Meeting

In June, the Schistosomiasis Consortium for Operational Research and Evaluation held its Annual Meeting to discuss the findings thus far of all the studies funded by the Bill & Melinda Gates Foundation grant directed here at UGA. The meeting brought together 35 researchers from across Africa and Europe, as well as the United States. Also participating were representatives from the Centers for Disease Control and Prevention, U. S. Agency for International Development, The Bill & Melinda Gates Foundation, the Task Force for Global Health, the Swiss Tropical Public Health Institute, The Natural History Museum, Leiden University, and the WHO/ Geneva.



12th Annual EuPathDB Workshop

Jessie Kissinger organized and taught the annual EuPathDB workshop that is held each spring at UGA. It is a week-long event that had 30 global participants ranging from graduate students to faculty members.



2017 PREP Scholars

On July 1, we welcomed the new class of PREP Scholars. The NIH-funded PREP program provides post-baccalaureate training to minority students who wish to go on to graduate school. During the year long program, the scholars will receive intensive GRE prep training as well as hands on biomedical research experience.

Coming soon to the Flow Cytometry Facility

With funds from an NIH Shared Instrumentation Grant an ImageStream Imaging Flow Cytometer has been purchased. It will allow researchers to image cells at the same speed they analyze them through flow cytometry, allowing them to gain valuable information on not only whether or not a cell is expressing a particular marker but also where in the cell the marker is located.

Domestic and International Presentations

Daniel Colley presented a seminar at the Leiden University Medical Center in the Netherlands. He also made two presentations based on the results of the longitudinal studies by SCORE at the NTD Summit, a global meeting on Neglected Tropical Diseases (NTD). He reported that annual treatment of children with the anti-schistosomal drug praziquantel results in significant lowering of prevalence and intensity of schistosomiasis for a community and less morbidity for individuals.

Jessie Kissinger was invited to give a talk at the International Giardia and Cryptosporidiosis meeting in Cuba. It was focused on their databases, GiardiaDB and CryptoDB. She also was invited to teach a data mining workshop in Manaus, Brazil at the International Congress of *Plasmodium vivax* Research. Undergraduates at the University of Chicago invited Jessie to speak at the Honor's Program's Rowley Seminar.

Silvia Moreno was the plenary speaker at the 12th International Coccidiosis Conference in San Antonio, TX. She was also invited to speak at the University of Montpellier and the University of Glasgow.

Courtney Murdock was invited to speak at a number of conferences including the NSF RCN VectorBite 2017 annual meeting hosted at the Imperial College, UK, American Society for Microbiology Annual Meeting in New Orleans for their plenary session on microbes and climate change, Ecology and Evolution of Infectious Diseases in Santa Barbara, and the Impact of Environmental Changes on Infectious Diseases in Trieste, Italy.

Blanka Tesla, a graduate student in the Murdock Laboratory, gave a talk on correlating Zika viral dose and transmission potential in field-derived *Aedes aegypti* mosquitos at the American Society for Virology (ASV) annual meeting. She received travel grants from ASV and UGA's Graduate School Travel Fund.

Mike Strand was the keynote speaker at the North American Comparative Immunology Conference in Raleigh, NC; 6th International Symposium on Insect Physiology, Biochemistry & Molecular Biology and 3rd Annual International Conference on Insect Genomics in Hangzhou, China; and the Society of Invertebrate Pathology Annual Meeting in San Diego.

Chris West was invited to Boston University School of Dental Medicine's Department of Molecular & Cell Biology to give a seminar.

Trainees complete program

Talissa Watts, a Pike County High School intern in Ynes Ortega's lab, has received a full scholarship to Tufts University.

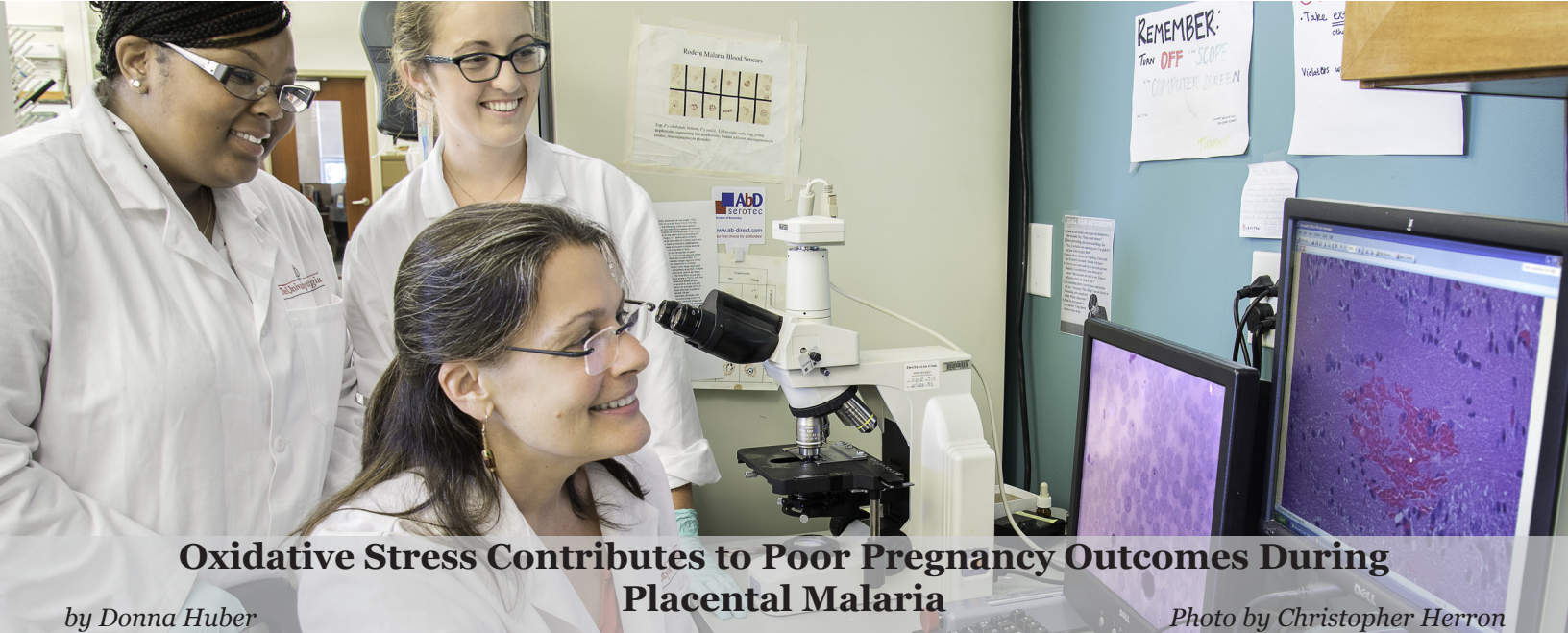
Taylor Thomas, also a Pike County High School intern in Ynes's lab, will be attending the University of Florida.

Sumiti Vinayak will be joining the faculty at the University of Illinois, Champaign-Urbana.

Mattie Pawlowic, also in Boris's lab, is moving to Dundee, Scotland to join the faculty at the Wellcome Trust Center.

Kavita Bitra, a post-doc from Mike's lab, has taken a research position with Bayer Corporation in Raleigh, NC.

Keven Vogel, also a post-doc from Mike's lab, has started a tenure track faculty position at UGA.



Oxidative Stress Contributes to Poor Pregnancy Outcomes During Placental Malaria

by Donna Huber

Photo by Christopher Herron

Julie Moore and her colleagues at the University of Georgia have determined that oxidative stress plays a role in the poor pregnancy outcomes that occur during placental malaria. Furthermore, they have identified the antioxidant tempol (TPL) as a potential therapeutic treatment.

Placental malaria is characterized by sequestration of *Plasmodium falciparum*, the parasite that causes malaria, in the maternal placental blood space. The ensuing damage to the placenta results in complications such as dangerously low birth weight, spontaneous abortion and stillbirth. About 200,000 infants die annually as a result of placental malaria.

Pregnancy causes women to be more susceptible to malarial infection; however, it is an area of malarial research that has been long neglected. Moore and her research team have studied the effects of malaria on pregnancy for more than 20 years.

Oxidative stress is an imbalance between the production of free radicals and the ability of the body to counteract or detoxify their harmful effects through the neutralization by antioxidants.

Evidence of oxidative stress in human placental malaria was observed through immunohistochemical detection of lipid peroxidation, which occurs in the presence of oxygen radicals. This observation motivated mechanistic studies of malaria-induced oxidative stress in mouse model. Other researchers have determined that oxidative stress contributes to pathogenesis for another *Plasmodium* parasite. Based on those findings, Moore hypothesized that oxidative stress participates in the pathogenesis of infection with *Plasmodium chabaudi* AS, a murine infective parasite, during early pregnancy.

Their findings, published in *ImmunoHorizons*, support their hypothesis that oxidative stress contributes to poor pregnancy outcomes during placental malaria. Furthermore, their findings corroborate studies by other research groups that malaria impacts the antioxidant response in the placenta and promotes oxidative stress.

In their study, the Moore group looked at two possible antioxidants to combat the effects of oxidative stress on placental malaria pregnancy in mice.

First, they looked at N-acetylcysteine (NAC). The results indicate that, at the dose used in this study, NAC failed to improve pregnancy outcome in *P. chabaudi* AS-infected mice. In fact, 50% of NAC-treated infected mice aborted earlier than the control group of infected mice. Due to the possible toxicity of NAC, they did not further explore the use of NAC.

Next, they turned to TPL, a superoxide dismutase mimetic, which has been studied extensively in animal models of increased free radicals and oxidative stress.

While the intraperitoneally delivered TPL did not impact the outcome of infections in terms of weight change, anemia, or course of parasitemia, infected TPL-treated mice did show a significantly higher proportion of viable embryos compared to the untreated infected mice.

Following this promising outcome, the group next tested if constant administration via drinking water could improve the outcome. They found the proportion of viable embryos in infected TPL-treated mice was significantly higher than in the untreated infected mice. TPL efficacy was variable at the placental level; embryo viability was highest in those animals with TPL-mediated reduction in placental lipid peroxidation.

Their results from the study indicate that TPL delivered orally ad libitum has a limited but significant positive effect on embryo survival in infected mice.

They tentatively conclude, in the absence of confirmation of TPL in plasma or urine, bioavailability for TPL in the placenta is poor, but in cases in which it can reach effective local concentrations, oral TPL can suppress placental lipid peroxidation and positively impact embryo outcome.

An online version of the study is available at <https://doi.org/10.4049/immunohorizons.1700002>

Recently Published Papers

Silvia Moreno and collaborators reported a connection between the tubulovesicular network and ion homeostasis with the parasite, and thus a novel role for the vacuole of *Toxoplasma gondii*. [Cellular Microbiology](#)

Courtney Murdock and collaborators published a study in which they measured the impact of temperature on Zika, dengue, and

chikungunya transmission by two of the most common mosquito vector species for these viruses, *Aedes aegypti* and *Ae. albopictus*. [PLoS Neglected Tropical Disease](#)

Chris West and collaborators showed that the Bvg phase mediates the interactions of a species of *Bordetella* with the common soil amoeba. Their findings raise the possibility of potential environmental sources for the frequently unexplained outbreaks of diseases caused by this and other *Bordetella* species. [PLoS Biology](#)

Mark Brown and Andrew Nuss from the University of Nevada reported the first evidence for insulin-like peptide functional conservation across two mosquito subfamilies. [General and Comparative Endocrinology](#)

Belen Cassera and collaborators reported the structural elucidation and stereochemical assignment of four compounds that have been identified for possible antimalarial drug development. [Journal of Natural Products](#)

Roberto Docampo and collaborators used the CRISPR/Cas9 technique that they recently developed for *Trypanosoma cruzi* to knockout two components of the mitochondrial calcium uniporter (MCU), the pore subunit, a MCU^b, which was purposed as a negative regulator of MCU in human cells. In contrast to what occurs in human cells, MCU is not essential, while MCU^b is essential for growth, differentiation, and infectivity, has a bioenergetics role, and does not act as dominant negative subunit of MCU. [MBIO](#)

Silvia Moreno and **Jessie Kissinger** collaborated with researchers at Johns Hopkins Bloomberg School of Public Health and in Brazil to report the identification of a new *Toxoplasma gondii* carbonic anhydrase-related protein (TgCA-RP), which localizes to rhoptries (specialized secretory organelles that contain proteins, many of which are secreted during invasion) of mature tachyzoites (an infectious stage of *T. gondii*). [mSphere](#)

Jessie Kissinger and recently graduated Ph.D. student **Ousman Mahmud** analyzed the apicomplexan repertoire to infer the ancestral state of the sugar transporter gene family to gain greater insight into the evolution of the apicomplexan sugar transporter gene family. [International Journal of Genomics](#)

Dennis Kyle and collaborators had a paper accepted in which they reported the findings of their investigation of phenotypic differences of high-grade chloroquine (CQ) resistance in both *Plasmodium falciparum* and *P. vivax*, the parasite that cause malaria, and the ability of known CQ resistance reversal agents (CQRRAs) to alter CQ susceptibility. [Antimicrobial Agents and Chemotherapy](#)

Pat Lammie and collaborators reported on a novel method they developed to measure changes in transmission from quantitative antibody levels that can be applied to diverse pathogens of global importance. [PLoS Neglected Tropical Diseases](#)

Julie Moore and her lab provided the first evidence that *Helicobacter typhlonius* infection is sufficient to interfere with the reproductive success and embryo health of C57BL/6J mice. The recommend animal research facilities implement *Helicobacter* spp. surveillance and control practices to avoid confounding experimental results and to improve breeding colony efficiency. [Journal of the American Association for Laboratory Animal Science](#)

Boris Striepen and collaborators published the findings of their study that suggests that drug exposure in the large intestine is essential for generating a superior in vivo response, and that physiologically based pharmacokinetic models can assist in the prioritization of leading preclinical drug candidates for in vivo

testing. [The Journal of Infectious Diseases](#)

Silvia Moreno and collaborators reported evidence that it is possible to develop drug combinations that act synergistically by inhibiting host and parasite enzymes in vitro and in vivo. [Antimicrobial Agents and Chemotherapy](#)

Courtney Murdock and collaborators conducted a field experiment with the Asian tiger mosquito to explore how microclimate variation across an urban landscape affects mosquito life history and potential to transmit arboviruses, like dengue. They demonstrate that climate condition captured by weather stations do not reflect relevant mosquito microclimate, and that subtle variations in mean and diurnal ranges of temperature and relative humidity can lead to appreciable variation in key mosquito/pathogen traits that are important for transmission. [PLoS Neglected Tropical Diseases](#)

Mark Brown and **Mike Strand** report the first evidence that aerobic respiration by bacteria plays an essential role in mosquito development. This information can potentially be used to develop tools for disabling the growth of larval mosquitoes into adults. [PNAS](#)

Belen Cassera and collaborators discuss the isolation, structure elucidation, total synthesis, and biological evaluation of 7 compounds identified for possible antimalarial activity. [Bioorganic & Medicinal Chemistry](#)

Dennis Kyle and collaborators showed for the first time the mechanism of resistance to mefloquine and that mefloquine and atovaquone resistance is transmissible through mosquitos. [Antimicrobial Agents and Chemotherapy](#)

Boris Striepen and collaborators published findings that broaden their understanding of the evolution and mechanistic workings of a unique parasite organelle and may lead to new opportunities for treatments against important human pathogens. [MBIO](#)

Belen Cassera and collaborators reported on possible antimalarial compounds from the southern magnolia. [Chemistry & Biodiversity](#)

Pat Lammie and collaborators published preliminary evidence that schistosomiasis program impact can be monitored using serologic responses. [American Journal of Tropical Medicine & Hygiene](#)

In another study, **Pat Lammie** and collaborators concluded that a combined intervention including deworming and improvements in life condition is more effective, in terms of proportion of subjects cured than deworming alone in a soil-transmitted helminth in northwestern Argentina. [American Journal of Tropical Medicine & Hygiene](#)

Jessie Kissinger and collaborators published a *Plasmodium knowlesi* genome sequence that provides a framework that will permit a better understanding of the SICAvir repertoire, selective pressures acting on this gene family and mechanisms of antigenic variation in this species and other pathogens. [Parasitology](#)

Ynes Ortega and her team at UGA reported the findings of a study focused on determining the effect of storage temperature on survival of initially high and low levels of *Salmonella* in dry-inoculated sucrose and wet-inoculated sucrose. [Journal of Food Protection](#)

Don Champagne and colleagues investigated the transcriptome-level responses associated with a persistent propagative phyto-virus infection in various life stages of its vector. [Journal of General Virology](#)