



Center for
Emerging,
Zoonotic, and
Arthropod-borne
Pathogens

Distinguished Speaker Seminar Series in Infectious Disease FALL 2021

August 31, 2021:

Kishana Taylor, Ph.D. *Co-founder and president of the Black Microbiologist Association*

"Centering Equity in Infectious Disease Research" [Recorded Video](#)

Host: Rebecca Taylor, Ph.D.

September 7, 2021:

Gerry Wright, Ph.D. *Distinguished University Professor at McMaster University and the Michael G. DeGroot Chair in Infection and Anti-Infective Research*

"Mining biosynthetic pathways for new antibiotics" [Recorded Video](#)

Host: Andrew Lowell, Ph.D.

September 14, 2021:

Kim Orth, Ph.D. *W.W. Caruth, Jr. Scholar in Biomedical Research and the Earl A. Forsythe Chair in Biomedical Science at The University of Texas Southwestern Medical Center*

"How *Vibrio parahaemolyticus* invades and escapes from host cells" [Recorded Video](#)

Host: Ann Stevens, Ph.D.

September 21, 2021:

James Van Etten, Ph.D. *Member of the National Academy of Science and the William Allington Distinguished Professor of Plant Pathology at the University of Nebraska*

"Adventures with Giant Algal Viruses" [Recorded Video](#)

Host: Frank Aylward, Ph.D.

September 28, 2021:

Carrie Harwood, Ph.D. *Member of the National Academy of Sciences and the Gerald and Lyn Gristein Professor of Microbiology at the University of Washington*

"Bacterial longevity" [Recorded Video](#)

Host: X.J. Meng, Ph.D.

October 5, 2021:

Paul D. Roepe, Ph.D. *Co-Director of Georgetown University's Center for Infectious Disease*

"Using Chemistry to Understand Antimalarial Drug Resistance" [Recorded Video](#)

Host: Dr. Paul Carlier, Ph.D.

October 12, 2021:

Rodrigo Almeida, Ph.D. UC Berkeley Hildebrand-Maumeister Chair in Plant Pathology

"Plant disease epidemics as opportunities to evaluate and gain knowledge" [Recorded Video](#)

Host: Boris Vinatzer, Ph.D.

October 19, 2021:

Sonia Hernandez, Ph.D. Professor of Wildlife Disease and Wildlife at the University of Georgia

"Why Care about Urban Wildlife Health?" [Recorded Video](#)

Host: John Maurer, Ph.D.

October 26, 2021:

Shawn Chen, Ph.D. Professor at the Biodesign Center for Immunotherapy, Vaccines and Virotherapy at Arizona State University

"Enhance the Efficacy and Safety of Monoclonal Antibody-Based Therapeutics Against Viral Diseases"

Host: Mike Zhang, Ph.D.

November 2, 2021:

Juergen Richt, Ph.D. Regents Distinguished Professor of Diagnostic Medicine Pathobiology at Kansas State University

"Adventures in COVID-19 Research" [Recorded Video](#)

Host: Kylene Kehn-Hall, Ph.D.

November 9, 2021:

Scott Weaver, Ph.D. Director of the Institute for Human Infections and Immunity and the John Sealy Distinguished University Chair in Human Infections and Immunity at the University of Texas Medical Branch

"Mechanisms of Urban Arbovirus Emergence" [Recorded Video](#)

Host: Jonathan Auguste, Ph.D.

November 16, 2021:

ID IGEP Affiliated Student Research Presentations:

Benjamin Davis (Pruden Lab) ***"Environmental Surveillance of Antibiotic Resistance"***

Alexandra Longest (Marr Lab) ***"Enveloped Virus Stability during Droplet Evaporation"***

Will Stone (Auguste Lab) ***"Camelid nanobodies as a Prophylactic for SARS-CoV-2"***

November 30, 2021:

ID IGEP 1st Co-hort Research Presentations:

Caitlin Armstrong "*Investigating the roles of innate immune exhaustion and CX3CR1 expression on the pathogenesis of cardiovascular disease in systemic lupus erythematosus*"

Ahmed Garba "*Determining the Prevalence of Tick-borne Viruses Circulating in Virginia using a One-Health Approach.*"

Abdullahi Jamiu "*Past, present and future; a tale of my graduate research*"

Jason Pough "*Rotations and Scientific Training in the Agricultural Sciences*"

Marcel Eddin "*Mychala's rotations within the biology dept*"

Mychala Snead "*Marcel's previous and current research work*"

Poonam Tajanpure "*Rotations and future research work*"

Morgen VanderGeissen "*Effects of Mosquito and Host Factors on Virus Transmission and Pathogenesis*"

December 7, 2021:

Latania Logan, Ph.D. Chief of the Section of Infectious Diseases in the Department of Pediatrics at the Rush University Hospital

A Rolling Plasmid Makes a Mess: Antibiotic Resistance and Its Impacts on Children

Host: Amy Pruden, Ph.D.

DISTINGUISHED SPEAKER SEMINAR SERIES
IN INFECTIOUS DISEASE

CENTERING EQUITY IN INFECTIOUS DISEASE RESEARCH

AUGUST 31, 2021 AT 12:00 PM
VIA ZOOM

DR. KISHANA TAYLOR
RUTGERS UNIVERSITY
CO-FOUNDER AND PRESIDENT OF THE
BLACK MICROBIOLOGISTS ASSOCIATION



Center for Emerging, Zoonotic, and Arthropod-borne Pathogens (CeZAP)
Distinguished Speaker Seminar Series in Infectious Diseases
Tuesday, August 31, 2021 at 12:00 Noon

Recorded Video

The SARS CoV2/COVID-19 pandemic brought to the forefront existing inequalities in infectious disease research, medicine and beyond. However, these inequalities have existed and have been exposed by other global pandemics and are replicated in other infectious disease cycles in the U.S. including but not limited to vector borne disease

MINING BIOSYNTHETIC PATHWAYS FOR NEW ANTIBIOTICS

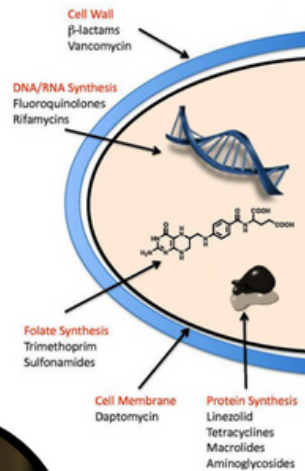
SEPTEMBER 7, 2021 AT 12:00 PM
VIA ZOOM

DR. GERRY WRIGHT

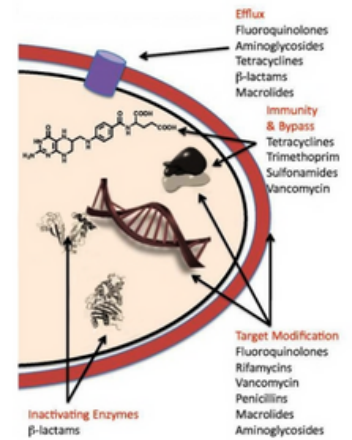
Distinguished University Professor
Michael G. Degrotte Chair in Infection and
Anti-Infective Research
MCMASTER UNIVERSITY



Antimicrobial Discovery



Antibiotic Resistance



Center for Emerging, Zoonotic, and Arthropod-borne Pathogens (CeZAP)

Distinguished Speaker Seminar Series in Infectious Diseases

Tuesday, September 7, 2021 at 12:00 Noon

Recorded Video

The antibiotic resistance crisis is confounded by an anemic discovery drug discovery pipeline. Conventionally, antibiotic drugs have primarily been sourced from microbial natural products, but these have largely been abandoned over the past 25 years in favor of screens of synthetic compound libraries. However, this pivot to synthetic compounds has not yielded any new drugs, suggesting a return to natural products might be warranted. One of the impediments to returning to microbial natural products as sources for leads for new antimicrobials is the rediscovery of known compounds when using traditional phenotypic extract screens. With the availability of thousands of microbial genome sequences, we now understand that such an approach does not comprehensively sample the potential of most microbes to produce new compounds. By directly exploring microbial genomes and identifying biosynthetic programs that have not yet been fully explored for their antibiotic potential, it is possible to select organisms and pathways likely to yield novel chemistry and antimicrobial activity. This approach, coupled with synthetic biology tools to exploit these pathways, can discover new antibiotics with new modes of action. Examples of our recent work using this genomes-first strategy coupled with a phylogenomic filter will be presented.

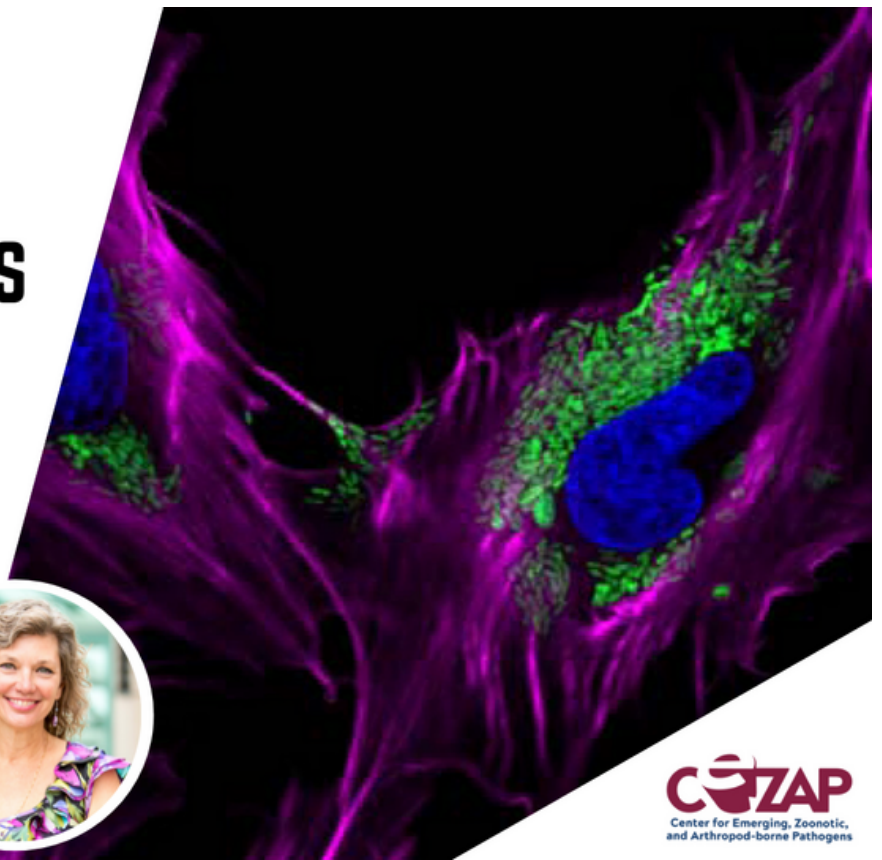
DISTINGUISHED SPEAKER SEMINAR SERIES
IN INFECTIOUS DISEASE

HOW VIBRIO PARAHAEMOLYTICUS INVADES AND ESCAPES FROM HOST CELLS

SEPTEMBER 14, 2021 AT 12:00 PM
VIA ZOOM

DR. KIM ORTH

W.W. CARUTH, JR. SCHOLAR IN BIOMEDICAL RESEARCH;
EARL A. FORSYTHE CHAIR IN BIOMEDICAL SCIENCE
UT SOUTHWESTERN MEDICAL CENTER



Center for Emerging, Zoonotic, and Arthropod-borne Pathogens (CeZAP)
Distinguished Speaker Seminar Series in Infectious Diseases
Tuesday, September 14, 2021 at 12:00 Noon

Recorded Video

My lab is interested in elucidation the activity of virulence factors from pathogenic bacteria so that we can gain novel molecular insight into eukaryotic signaling systems. The marine bacterium *Vibrio parahaemolyticus* is the worldwide leading cause of seafood-borne acute gastroenteritis. We are working on the two *V. parahaemolyticus* type 3 secretion systems (T3SS1 and T3SS2) and their bacterial effectors to understand how signaling systems in the eukaryotic host can be manipulated by these bacterial pathogens. Each of the two T3SSs uses a unique repertoire of effectors to manipulate host signaling. The first T3SS1 is thought to be used maintain *V. parahaemolyticus*' survival in the environment, while the second T3SS2 is used for pathogenesis in an animal host. For decades, this pathogen has been studied exclusively as an extracellular bacterium. However, recent studies from our lab have revealed the pathogen's ability to invade and replicate within host cells using the second T3SS2. These studies have elucidated novel evolutionarily conserved mechanism that used by both host and pathogen. One of these, AMPylation, is an important mechanism used for maintaining homeostasis by all metazoan cells when under stress. Our work at UT Southwestern is accomplished using a broad range of tools, including biochemistry, molecular microbiology, protein chemistry, structural biology, yeast genetics, cell biology and more.

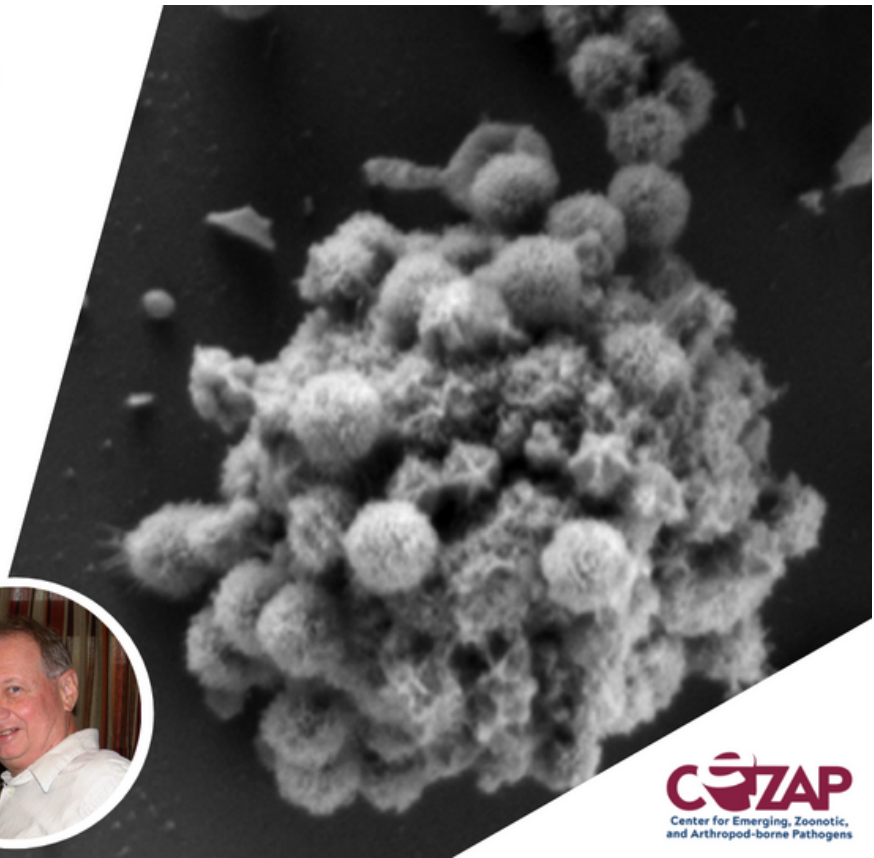
DISTINGUISHED SPEAKER SEMINAR SERIES
IN INFECTIOUS DISEASE

ADVENTURES WITH GIANT ALGAL VIRUSES

SEPTEMBER 21, 2021 AT 12:00 PM
VIA ZOOM

DR. JAMES VAN ETTEN

Member of the National Academy of Sciences;
William Allington Distinguished Professor
of Plant Pathology
UNIVERSITY OF NEBRASKA



Center for Emerging, Zoonotic, and Arthropod-borne Pathogens (CeZAP)
Distinguished Speaker Seminar Series in Infectious Diseases
Tuesday, September 21, 2021 at 12:00 PM EST

Recorded Video

The Van Etten laboratory studies large, plaque-forming dsDNA viruses that infect certain chlorella-like green algae that normally live as symbionts in other protists such as paramecia and heliozoae. The chloroviruses are ubiquitous in inland water sources and occasionally reach concentrations as high as thousands of plaque-forming units per ml of native water. Infection of their eukaryotic algal hosts differs from all other viruses infecting eukaryotic hosts but resembles that of some bacteriophages. Chlorovirus genomes are 290 to 370 kb in size and code for up to 400 proteins and 14 tRNAs. The chloroviruses encode many genes that had not been found in viruses previously including restriction and modification enzymes, the smallest functional potassium ion channel, the smallest chromatin remodeling enzyme that methylates lysine 27 in histone H3, a hyaluronan synthetase and five polyamine metabolic enzymes. Glycosylation of the chlorovirus major capsid proteins differs from all other viruses. The process occurs in the cytoplasm, and the machinery is at least partially encoded by the virus. The glycan structures are unique and we are currently identifying and characterizing the virus-encoded glycosyltransferases.

DISTINGUISHED SPEAKER SEMINAR SERIES
IN INFECTIOUS DISEASE

BACTERIAL LONGEVITY

SEPTEMBER 28, 2021 AT 12:00 PM (EST)
VIA ZOOM

DR. CARRIE HARWOOD

Member of the National Academy of Sciences
Gerald and Lyn Gristein Professor of Microbiology
UNIVERSITY OF WASHINGTON



Center for Emerging, Zoonotic, and Arthropod-borne Pathogens (CeZAP)
Distinguished Speaker Seminar Series in Infectious Diseases
Tuesday, September 28, 2021 at 12:00 Noon (EST)

Recorded Video

Microbiological research has focused primarily on understanding the physiology and dynamics of bacterial cells and populations during rapid growth. However, this rapid growth state is likely highly unusual in nature. It is known that many bacteria, including many pathogens, enter a growth-arrested state in which they remain viable for considerable periods of time. Although the existence of this crucial phase of bacterial “non-growth” has been appreciated for some time, the challenge has been to study it in the laboratory. We have overcome this barrier by identifying an organism called “Rpal” that is an excellent model of studies of bacterial longevity in the laboratory. I will describe our work on the physiology of “non-growth” and describe longevity genes that we have identified.

USING CHEMISTRY TO UNDERSTAND ANTIMALARIAL DRUG RESISTANCE

OCTOBER 5, 2021 AT 12:00 PM
VIA ZOOM

DR. PAUL ROEPE

Professor, Dept. of Chemistry and
Dept. of Biochemistry & Cell. & Mol. Biol.
GEORGETOWN UNIVERSITY

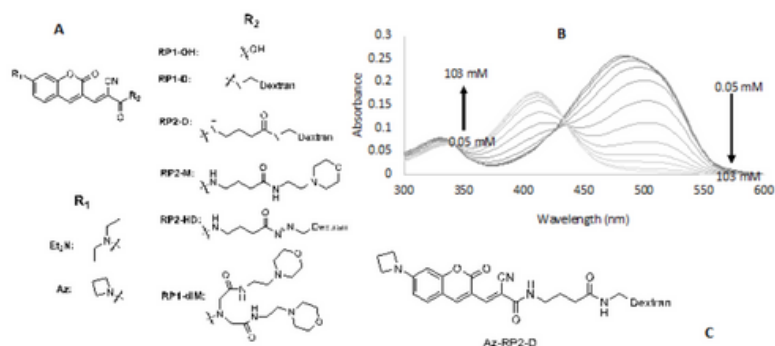


Fig. 7 A) Overview of new conjugated probe series based on azetidiny coumarin "I" for live malarial parasite intracellular imaging [Willems A., & Roeppe, P.D. manuscript in preparation]; see Jiang, X., et al., (2017), Nature Communications 8, 16087. PMID: 28703127



Center for Emerging, Zoonotic, and Arthropod-borne Pathogens (CeZAP)
Distinguished Speaker Seminar Series in Infectious Diseases

Tuesday, October 5, 2021 at 12:00 Noon

Recorded Video

This seminar will summarize chemical biology and biochemical approaches for elucidating the molecular mechanisms of antimalarial drug resistance phenomena. Combining drug probe synthesis with live cell microscopy and other biophysical techniques has been central to our work for many years. Recently, capitalizing on the characterization of coumarin - based fluorescent glutathione probes we have synthesized less expensive and more convenient probes in this class including interesting morpholino derivatives and dextran conjugates, have characterized their GSH - dependent fluorescence, and have begun to quantify their localization and intensity within the live malarial parasite. Synthesis of fluorescent antimalarial drug probes, in particular "NBD-chloroquine" and "NBD-piperaquine" have allowed detailed microscopic analyses of drug transport, and azidoperfluorophenyl "tagged" drug probes have allowed us to map drug binding sites for purified proteins.

Host: Paul R. Carlier, pcarlier@vt.edu

Professor, Department of Chemistry & Director, Virginia Tech Center for Drug Discovery

DISTINGUISHED SPEAKER SEMINAR SERIES
IN INFECTIOUS DISEASE

PLANT DISEASE EPIDEMICS AS OPPORTUNITIES TO EVALUATE AND GAIN KNOWLEDGE

OCTOBER 12, 2021 AT 12:00 PM
VIA ZOOM

Rodrigo Almeida, Ph.D.
Hildebrand-Laumeister Chair
in Plant Pathology
UNIVERSITY OF CALIFORNIA, BERKELEY



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VT | FRALIN LIFE SCIENCES INSTITUTE
VIRGINIA TECH

Center for Emerging, Zoonotic, and Arthropod-borne Pathogens (CeZAP)
Distinguished Speaker Seminar Series in Infectious Diseases
Tuesday, October 12, 2021 at 12:00 Noon (EST)

[Recorded Video](#)

Disease epidemics often have devastating consequences. Yet, epidemics also provide unique opportunities to evaluate and expand knowledge. We will discuss how epidemics of the vector-borne bacterial plant pathogen *Xylella fastidiosa* have led to research challenging established paradigms and created opportunities to expand research into new directions. We will also argue that plant diseases occur within social frameworks, and that we need to better understand how society is affected and affects plant disease control and management.

DISTINGUISHED SPEAKER SEMINAR SERIES
IN INFECTIOUS DISEASE

WHY CARE ABOUT URBAN WILDLIFE HEALTH?

OCTOBER 19, 2021 AT 12:00 PM
VIA ZOOM

Sonia Hernandez, Ph.D.
Professor, Wildlife Disease and Wildlife
UNIVERSITY OF GEORGIA



Center for Emerging, Zoonotic, and Arthropod-borne Pathogens (CeZAP)
Distinguished Speaker Seminar Series in Infectious Diseases
Tuesday, October 19, 2021 at 12:00 pm - 1:00 pm (EST)

Recorded Video

Urban wildlife ecology has become firmly established in The health of wildlife that has adapted to living in urban environments is important for a myriad of reasons. They serve as bioindicators of our urban environment, they are often important reservoirs for diseases of zoonotic concern—the dynamics of which are not homogenous throughout cities—while at the same time serving as one important way that humans connect to the natural world. I will detail some of the studies I’ve conducted to explore these themes and propose some new ways to view urban wildlife health.

DISTINGUISHED SPEAKER SEMINAR SERIES
IN INFECTIOUS DISEASE

ENHANCE THE EFFICACY AND SAFETY OF MONOCLONAL ANTIBODY- BASED THERAPEUTICS AGAINST VIRAL DISEASES

OCTOBER 26, 2021 AT 12:00 PM
VIA ZOOM

SHAWN CHEN, PH.D.

Professor, Biodesign Center for
Immunotherapy, Vaccines and Virotherapy
ARIZONA STATE UNIVERSITY



Center for Emerging, Zoonotic, and Arthropod-borne Pathogens (CeZAP)
Distinguished Speaker Seminar Series in Infectious Diseases
Tuesday, October 26, 2021 at 12:00 pm - 1:00 pm (EST)

The current devastating SARS-CoV-2 pandemic highlights the urgent need to develop efficacious interventions against viral diseases. Monoclonal antibodies (mAb) have been at the forefront of treatment for cancer due to their specificity and potency. While mAbs have shown promise as therapeutic candidates against viral diseases, their broad application to treat human viral diseases still faces several challenges including limited efficacy and the potential risk of predisposing treated patients to more severe secondary infection by related viruses through antibody-dependent enhancement (ADE). We have developed therapeutic mAb candidates against various viruses including West Nile, Dengue, Zika, Chikungunya, Ebola, and recently SARS-CoV-2. The progress of developing safer and more efficacious mAb therapeutics against viral diseases will be discussed within the context of their neutralization, effector function and in vivo efficacy. The progress of using glycoengineering to address ADE, the major impediment of therapeutic development for ADE-prone viruses will be highlighted. These advancements suggest that plant-based systems are excellent alternatives for addressing the remaining challenges of mAb therapeutic development against viral diseases and may facilitate the eventual commercialization of these drug candidates.

DISTINGUISHED SPEAKER SEMINAR SERIES
IN INFECTIOUS DISEASE

ADVENTURES IN COVID-19 RESEARCH

NOVEMBER 2, 2021 AT 12:00 PM
VIA ZOOM

Jürgen Richt, Ph.D.
Regents Distinguished Professor
KANSAS STATE UNIVERSITY



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and Arthropod-borne Pathogens



FRALIN LIFE SCIENCES INSTITUTE
VIRGINIA TECH

Center for Emerging, Zoonotic, and Arthropod-borne Pathogens (CeZAP)
Distinguished Speaker Seminar Series in Infectious Diseases
Tuesday, November 2, 2021 at 12:00 Noon

Recorded Video

The unprecedented pandemic caused by SARS-CoV-2 has accelerated research on the epidemiology and pathogenesis of SARS-CoV-2 as well as development of vaccines and therapeutics. In this presentation I will discuss some of the research conducted in my lab at Kansas State University, mainly on the susceptibility of various animal species to SARS-CoV-2 and potential therapeutic approaches.

DISTINGUISHED SPEAKER SEMINAR SERIES
IN INFECTIOUS DISEASE

MECHANISMS OF URBAN ARBOVIRUS EMERGENCE

NOVEMBER 9, 2021 AT 12:00 PM
FRALIN HALL AUDITORIUM

Scott Weaver, Ph.D.

John Sealy Distinguished University Chair in Human Infections and Immunity
Chair, Department of Microbiology & Immunology
Director, Institute for Human Infections & Immunity
Scientific Director, Galveston National Laboratory
THE UNIVERSITY OF TEXAS MEDICAL BRANCH



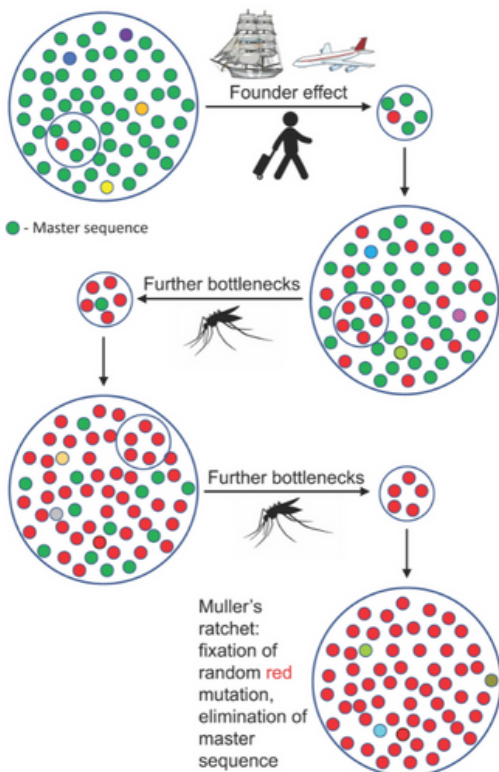
Center for Emerging, Zoonotic, and Arthropod-borne Pathogens (CeZAP)
Distinguished Speaker Seminar Series in Infectious Diseases

Tuesday, November 9, 2021 at 12:00 Noon

Seminar will be held in person

Fralin Hall Auditorium

Recorded Video



Among the mosquito-borne viruses that emerge to cause major epidemic disease, only dengue, yellow fever, chikungunya (CHIKV) and Zika (ZIKV) exploit humans as amplification hosts and peridomestic mosquitoes as vectors. CHIKV and ZIKA originated in sylvatic, enzootic transmission cycles in Africa, followed by spread to nearly global proportions since 2004. I will review current knowledge of enzootic transmission cycles in West Africa, and the history of spread to Asia and the Americas. I will also review evidence for fitness changes in these viruses during these periods of spread, highlighting evidence both of adaptive evolution for more efficient transmission by urban vectors, and of founder effects that reduced fitness, constraining epidemic emergence and affecting virulence of these two arboviruses.



STUDENT RESEARCH PRESENTATIONS

Center for Emerging, Zoonotic, and Arthropod-borne Pathogens (CeZAP)
Distinguished Speaker Seminar Series in Infectious Diseases

[Tuesday, November 16, 2021 at 12:00 Noon](#)

Seminar will be held in person in Fralin Hall Auditorium

This week we have the pleasure of hearing presentations from the following
ID IGEP affiliated students:

12:30 pm **Benjamin Davis** (*Pruden Lab*)

“Environmental Surveillance of Antibiotic Resistance”

12:50 pm **Alexandra Longest** (*Marr Lab*)

“Enveloped Virus Stability during Droplet Evaporation”

1:10 pm **Will Stone** (*Auguste Lab*)

“Camelid nanobodies as a Prophylactic for SARS-CoV-2”



STUDENT RESEARCH PRESENTATIONS

Center for Emerging, Zoonotic, and Arthropod-borne Pathogens (CeZAP)
Distinguished Speaker Seminar Series in Infectious Diseases

[Tuesday, November 30, 2021 at 12:00 Noon](#)

Seminar will be held in person at Fralin Hall Auditorium

This week we have the pleasure of hearing presentations from the first year ID IGEP Cohorts.

12:30pm **Caitlin Armstrong**

"Investigating the roles of innate immune exhaustion and CX3CR1 expression on the pathogenesis of cardiovascular disease in systemic lupus erythematosus"

12:35pm **Ahmed Garba**

"Determining the Prevalence of Tick-borne Viruses Circulating in Virginia using a One-Health Approach"

12:40pm **Abdullahi Jamiu**

"Past, present and future; a tale of my graduate research"

12:45pm **Jason Pough**

"Rotations and Scientific Training in the Agricultural Sciences"

12:50pm **Marcel Eddin**

"Marcel's previous and current research work"

12:55pm **Mychala Snead**

"Mychala's rotations within the biology dept"

1:00pm **Poonam Tajanpure**

"Rotations and future research work"

1:05pm **Morgen VanderGeissen**

"Effects of Mosquito and Host Factors on Virus Transmission and Pathogenesis"

DISTINGUISHED SPEAKER SEMINAR SERIES
IN INFECTIOUS DISEASE

A ROLLING PLASMID MAKES A MESS: ANTIBIOTIC RESISTANCE AND ITS IMPACT ON CHILDREN

DECEMBER 7, 2021 AT 12:00 PM
VIA ZOOM

Latania K. Logan, MD, MSPH
Chief of the Section of Infectious Diseases
in the Department of Pediatrics
RUSH UNIVERSITY MEDICAL CENTER



Center for Emerging, Zoonotic, and Arthropod-borne Pathogens (CeZAP)
Distinguished Speaker Seminar Series in Infectious Diseases

[Tuesday, December 7, 2021 at 12:00 Noon](#)

Zoom Link: <https://viriniatech.zoom.us/j/89419666443>

Enterobacterales are increasingly resistant to multiple antibiotics, making them a global epidemic public health threat. Multi-drug resistant Enterobacterales (MDR Ent) infections were historically limited to healthcare settings, but over the past two decades there have been significant increases in infections occurring in otherwise healthy children and adults without prior healthcare contact. In this seminar, we will discuss my research on the clinical and molecular epidemiology of MDR Ent in children and young adults, address factors associated with MDR Ent infection in this population, and discuss the importance of community reservoirs in acquisition and spread of these dangerous pathogens.