



Center for  
Emerging,  
Zoonotic, and  
Arthropod-borne  
Pathogens

## Distinguished Speaker Seminar Series in Infectious Disease Spring 2023

### **January 19, 2023:**

ID IGEP Presentations: **Jason Pough, Hannah Ivester, Jonathan Joyce**

### **January 26, 2023:**

**Kristy Murray, D.V.M., Ph.D.** | BCMP Professor, Baylor College of Medicine & **Sarah Gunter Ph.D.** Assistant Professor, Baylor College of Medicine *"Implementing and expanding acute febrile illness surveillance for emerging pathogens in LMIC countries during a pandemic"*

Host: Jonathan Auguste, Ph.D. & Kylene Kehn-Hall, Ph.D

### **February 2, 2023:**

Virtual Seminar Zoom: <https://virginiatech.zoom.us/j/89419666443>

**Andres Velasco-Villa, Ph.D.** Center for Disease Control and Prevention (CDC) *"Molecular typing of rabies virus: a tool that has enhanced the elimination of the dog rabies cycle across Latin America"*

### **February 9, 2023:**

**Nadia Romero-Gallardo, DVM,** CDC One Health Office *"One World-One Health"*

Host: Luis Escobar

### **February 16, 2023:**

**Rachel Silverman, Ph.D., ScM,** Research Scientist, VMCVM *"Using routinely collected public health data for epidemiologic research during the evolving COVID-19 pandemic"*

### **February 23, 2023:**

Virtual Seminar Zoom: <https://virginiatech.zoom.us/j/89419666443>

**Shawna McCallin, Ph.D.** École Polytechnique Fédérale de Lausanne *"Phage Therapy: Test tube to new treatments"*

Host: Bryan Hsu, Ph.D



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**March 2, 2023:**

Kylene Kehn-Hall, MS, Ph.D., Professor, VMCVM

*"Discovery of novel protein:protein interactions for emerging viral countermeasure development"*

**March 16, 2023:**

David Schmale, Ph.D., Professor, SPES, CALS *"Transport of microbes at interfaces"*

**March 23, 2023:**

Zhaomin Yang, Ph.D., Professor, COS *"Bacterial type IV pilus as a motility apparatus and anti-virulence target"*

**March 30, 2023:**

Virtual Seminar Zoom: <https://virginiatech.zoom.us/j/89419666443>

Taylor Earley, Ph.D., Leidos Biomedical Research Inc. *"Improving Human Health through Innovative Research: an in depth look at Pilot Plant Clinical Manufacturing at the Vaccine Clinical Materials Program."*

Host: Birgit Scharf, Ph.D.

**April 13, 2023:**

Virtual Seminar Zoom: <https://virginiatech.zoom.us/j/89419666443>

Jason Crawford, Ph.D., Associate Professor of Chemistry and Microbial Pathogenesis, Yale University *"Metabolism at the Host-microbe Interface"*

Host: Emily Gentry, Ph.D.

***Bonus Seminar Week***

**April 17, 2023:**

Kristen Nielsen, Ph.D., Professor, Dept of Microbiology and Immunology, University of Minnesota

*"Cryptococcus Cell Wars: The Ultimate Battle Between Host and Pathogen"*

Host: Kylene Kehn-Hall, Ph.D

**April 20, 2023:**

Seminar co-sponsored by CeZAP and Entomology Seminar Series

Shannon Ronca, Ph.D., Baylor College of Medicine *"Polycyclic aromatic hydrocarbons (PAHs) alter COVID-19 pathogenesis in mice"*

**April 27, 2023:**

Virtual Seminar Zoom: <https://virginiatech.zoom.us/j/89419666443>

Chris Bella, PhD. University of Innsbruck *"Metagenomics to Unlock Hidden Viruses in Protists"*

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Thursday, January 19, 2023 at 12:30 pm  
in Person at Fralin Auditorium



### ID IGEP affiliated student Research Presentations

Join us this Thursday in Fralin Auditorium for the CeZAP Distinguished Speaker Seminar Series in Infectious Disease. Our Spring 2023 series kicks off with presentations by the following ID IGEP affiliated students.

- **Jason Pough**, *Kuhn Lab*
- **Hannah Ivester**, *Allen Lab*
- **Jonathan Joyce**, *Bertke Lab*



# IMPLEMENTING AND EXPANDING ACUTE FEBRILE ILLNESS SURVEILLANCE FOR EMERGING PATHOGENS IN LMIC COUNTRIES DURING A PANDEMIC



*Kristy Murray, DVM, Ph.D.*  
Professor  
BAYLOR COLLEGE OF MEDICINE



*Sarah Gunter, Ph.D.*  
ASSISTANT PROFESSOR  
BAYLOR COLLEGE OF MEDICINE

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**Thursday, January 26, 2023 at 12:30 pm**  
**in Person at Fralin Auditorium**

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Emerging pathogens are global public health threats, with low to middle income countries in Central America having disproportionately high risks for transmission due to large population centers, areas of extreme poverty, and tropical climates. Vector-borne, respiratory, and enteric pathogens are of high concern in these vulnerable populations. In deeply impoverished communities that lack public health infrastructure, general health can be poor and malnutrition prevalent, leading to a higher risk of adverse outcomes from vector-borne, respiratory, and enteric pathogens. Outbreaks can overwhelm public health systems and severely strain the current diagnostic and case management capacities at the local level. To combat these disease threats, we convened a multi-disciplinary international team to create an acute febrile illness (AFI) surveillance network to detect and diagnose vector-borne, respiratory, and enteric pathogens within sentinel hospitals and clinics throughout Belize and El Salvador. This collaborative network provides a critical resource for capacity building, training, applied research, diagnostics, and integrated real-time surveillance for emerging pathogens. In this talk, we will discuss implementing AFI surveillance systems in Belize and El Salvador, diagnostic testing results for 55 pathogens for the >6,000 patients enrolled to date, expansion of the surveillance systems to include COVID testing and sequencing capacity, and the epidemiology of outbreaks detected through the AFI surveillance, including cholera. Through this research, we can understand, detect, and respond to infectious disease threats in this unique, high-risk region.

**DISTINGUISHED SPEAKER SEMINAR SERIES  
IN INFECTIOUS DISEASE**

# **MOLECULAR TYPING OF RABIES VIRUS: A TOOL THAT HAS ENHANCED THE ELIMINATION OF THE DOG RABIES CYCLE ACROSS LATIN AMERICA**

**FEBRUARY 2, 2023 AT 12:30 PM**

VIRTUAL SEMINAR - ZOOM

**Andres Velasco-Villa, Ph.D.**

Centers for Disease Control and Prevention, National Center for  
Emerging Zoonotic Infectious Diseases/Division of High  
Consequence Pathogens and Pathology/Pox virus and Rabies Branch

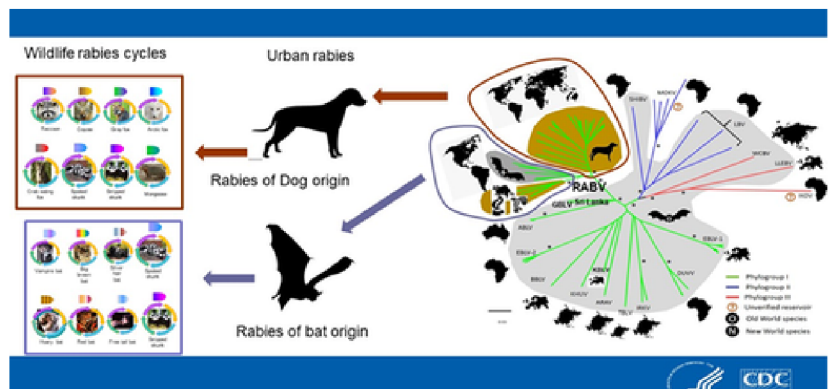


**Thursday, February 2, 2023 at 12:30 pm**

**ZOOM ONLY: <https://viriniatech.zoom.us/j/89419666443>**

Reporting rabies in species of public and animal health interest based on standard clinical definitions, was for decades, the best indicator to measure the impact of rabies control. The broad application of the direct fluorescent antibody test through decentralized laboratory networks, not only enhanced rabies virus (RABV) detection, but also allowed to rule out suspicious cases with great accuracy worldwide. In a concerted effort, Latin-American ministries of health, the Pan-American Health Organization (PAHO) and the Centers for Disease Control and Prevention (CDC) implemented RABV antigenic typing with a reduced panel of eight monoclonal antibodies in 1994. Albeit this technology discriminates among major rabies cycles prevalent across Latin-America and the Caribbean, it has limitations to differentiate among current cycles specifically associated with dogs from those recognized and subsequently established in coyotes, foxes, mongoose and skunks that have ancestral evolutionary origins in primal dog rabies cycles. To overcome such limitations the CDC developed genetic typing protocols that were widely implemented across Latin America during the 80's-90's. The consistent identification of dog rabies cycles associated with geographically circumscribed rabies pockets (rabies foci), is paramount to attain an accurate follow up of dog rabies elimination. RABV genetic typing not only assisted to revealed for the first time persistent dog rabies foci, but also made evident control inequities that informed where more comprehensive and intense interventions were required. Conversely, the reproducible discrimination of established wildlife rabies cycles with close evolutionary ties with ancestral dog rabies cycles is critical to document a country free of the dog-mediated rabies. Over the course of the last five decades, Latin American countries have attained the successful

integration of a sustained long-term multidisciplinary, academic, interagency, multinational collaboration under the One Health framework, which was critical for the elimination of the public health burden inflicted by the dog rabies cycle in Latin America.



# ONE WORLD - ONE HEALTH

FEBRUARY 9, 2023

12:30PM IN FRALIN HALL AUDITORIUM



**Nadia F. Gallardo-Romero, DVM, DMCA**

One Health Liaison for the Division of Scientific Resources  
National Center for Emerging and Zoonotic Infectious Diseases  
CENTERS FOR DISEASE CONTROL AND PREVENTION



**Thursday, February 9, 2023 at 12:30 pm**  
**in Person at Fralin Auditorium**

One Health is the collaborative effort of multiple disciplines and with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants and our shared environment. While the COVID-19 pandemic is primarily spreading from person-to-person, we can't ignore the fact that a wide range of mammalian animals can host this virus. Lessons from other zoonotic diseases have taught us that pathogens with multiple hosts are more challenging to mitigate, and nearly impossible to eradicate. Addressing zoonotic transmissions using a One Health approach will allow us to better understand host range, identify potential establishment of new animal hosts and reservoirs, assess if and how transmission occurs between people and animals in close contact with people, understand how and why spillover and spillback events occur and how they can be prevented, track mutations and variants in animals and assess potential to affect severity, transmissibility, diagnostics, therapeutics, or vaccine efficacy.

**Did You Know?**  
**One Health** issues include:

- Zoonotic diseases
- Antibiotic resistance
- Food safety and security
- Vector-borne diseases
- Environmental health
- Chronic diseases
- Mental health
- Occupational health

...And more!

[www.cdc.gov/onehealth](http://www.cdc.gov/onehealth)

**DISTINGUISHED SPEAKER SEMINAR SERIES  
IN INFECTIOUS DISEASE**

# **USING ROUTINELY COLLECTED PUBLIC HEALTH DATA FOR EPIDEMIOLOGIC RESEARCH DURING THE EVOLVING COVID-19 PANDEMIC**

**FEBRUARY 16, 2023 AT 12:30 PM**  
FRALIN HALL AUDITORIUM

**Rachel A. Silverman, PhD, ScM**

Research Scientist, Epidemiologist  
Center for Public Health Practice & Research  
Dept of Population Health Sciences  
VIRGINIA-MARYLAND COLLEGE OF VETERINARY MEDICINE



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**Thursday, February 16, 2023 at 12:30 pm**  
**in Person at Fralin Auditorium**

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The evolving COVID-19 pandemic requires rapid and continuous data assessment to understand current conditions and inform effective risk-mitigation strategies. We are conducting epidemiologic research utilizing data that is routinely collected by the Virginia Department of Health and collaborators at Virginia Tech's Fralin Biomedical Research Institute. Our primary aims are to assess vaccine effectiveness in a variety of risk-settings and demographic populations in the context of different dominating viral-variants to inform recommendations. Dr. Silverman will present their work estimating vaccine effectiveness during a COVID-19 outbreak in a correctional facility in Southwest Virginia, an overview of planned projects, and challenges of working with this type of data.



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# PHAGE THERAPY: TEST TUBE TO NEW TREATMENTS

FEBRUARY 23, 2023 AT 12:30 PM  
VIRTUAL SEMINAR

Shawna McCallin, PhD  
Clinical and Phage Researcher  
ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

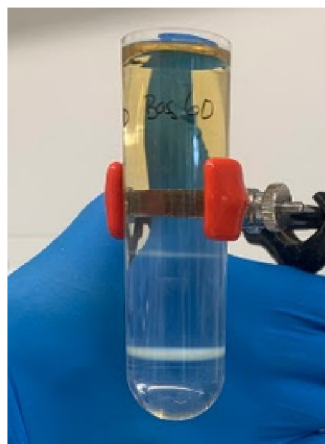


Thursday February 23, 2023 at 12:30 PM

Virtual Seminar: <https://viriniatech.zoom.us/j/89419666443>

Bacteriophages have been used for treating bacterial infections since before the discovery of penicillin, so why are there no approved phage-based medicines on the market? Previous attempts to demonstrate phage efficacy in humans have largely failed, despite promising preclinical data and successful compassionate cases. Understanding and correcting this disconnect between the test tube and clinical trials is the foundation of our research. Here I will present some of the translational hurdles that phage therapy faces in clinical development and give an overview of how compassionate treatments are done and our upcoming clinical trial using engineered bacteriophages for the treatment of catheter-associated urinary tract infections (CAUTIs).

Image: CsCl band of purified phages for treatment





DISTINGUISHED SPEAKER SEMINAR SERIES IN INFECTIOUS DISEASE



"DISCOVERY OF NOVEL PROTEIN: PROTEIN INTERACTIONS FOR EMERGING VIRAL COUNTERMEASURE DEVELOPMENT"

March 2 at 12:30

Fralin Hall Auditorium

Kylene Kehn-Hall, MS, PhD

Director of CeZAP

Professor, Dept of Biomedical Sciences & Pathobiology



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Thursday, March 2, 2023 at 12:30 pm  
in Person at Fralin Auditorium



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**DISTINGUISHED SPEAKER SEMINAR SERIES**  
**IN INFECTIOUS DISEASE**



**TRANSPORT OF MICROBES AT  
INTERFACES**

Thursday, March 16th at 12:30 pm

**Fralin Hall Auditorium**

**David G. Schmale III**

Professor, School of Plant & Environmental Services



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

**Speaker Seminar Series in Infectious Diseases**

**Thursday March 16, 2023 at 12:30 PM**

**Fralin Hall Auditorium**

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**"Transport of Microbes at Interfaces"**

New tools and technology are required to understand the transport of microbes at interfaces. Interfaces are spaces where different systems meet and interact with one another. High-speed videography was used to study the transport of microbes across the air-plant interface and the air-water interface. Microscopic tornadoes during rain events liberated spores from infected leaf surfaces. Sneezing plants expelled spores via jumping droplet condensation. Ice-nucleating bacteria were aerosolized from water in wind-driven spume droplets. Aerial and aquatic robots were deployed in freshwater lakes in the USA and New Zealand to understand the aerosolization and spread of toxic cyanobacteria across the air-water interface. New research aims to investigate how microbes at ice-air-water interfaces are released during melting and cracking. Our work has important implications for food security and public safety.

David G. Schmale III, PhD

Professor, School of Plant and Environmental Sciences, Virginia Tech

# DISTINGUISHED SPEAKER SEMINAR SERIES IN INFECTIOUS DISEASE



## BACTERIAL TYPE IV PILUS AT THE CROSSROADS OF BASIC AND TRANSLATIONAL SCIENCES

Thursday, March 23th at 12:30 pm  
LS 1 Conference Room

Zhaomin Yang, PhD

Professor, Biological Sciences



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**Thursday March 23, 2023 at 12:30 PM**

**Life Sciences 1 Building (LS1) Conference Room 101**

*(Note this is a change from Fralin Hall Auditorium)*

## "Bacterial Type IV Pilus at the Crossroads of Basic and Translational Sciences"

The bacterial type pilus is a nanomachine with functions in diverse biological processes. In the basic science realm, it is a motility apparatus for bacterial movement and an adhesin for biofilm formation. In the world of translational sciences, T4P is a valid target for antivirulence therapeutics because it is a virulence factor of many important bacterial pathogens. The Yang lab works on both fronts to understand the regulation of and by T4P in biofilm formation and to explore T4P as a chemotherapeutic target against antibiotic-resistant bacterial pathogens. This seminar will discuss some of the progress we have made in both basic and translational research on bacterial T4P.

Zhaomin Yang, PhD  
Professor of Biological Sciences

DISTINGUISHED SPEAKER SEMINAR SERIES  
IN INFECTIOUS DISEASE



IMPROVING HUMAN HEALTH THROUGH INNOVATIVE  
RESEARCH: AN IN DEPTH LOOK AT PILOT PLANT  
CLINICAL MANUFACTURING AT THE VACCINE  
CLINICAL MATERIALS PROGRAM.

Thursday, March 30th at 12:30 pm

Virtual Zoom

Taylor Earley, PhD

Lead Manufacturing Associate,  
Purification/Leidos Biomedical Research, Inc.,



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Thursday, March 30, 2023 at 12:30 pm

Virtual Seminar Zoom:

<https://virginiatech.zoom.us/j/89419666443>



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# DISTINGUISHED SPEAKER SEMINAR SERIES IN INFECTIOUS DISEASE



## METABOLISM AT THE HOST-MICROBE INTERFACE

Thursday, April 13th at 12:30 pm

Virtual Seminar - ZOOM

Jason Crawford, PhD

Associate Professor of Chemistry and Microbial Pathogenesis  
Yale University



Thursday, April 13, 2023 at 12:30 pm

Virtual Seminar Zoom:

<https://virginiatech.zoom.us/j/89419666443>

### "Metabolism at the Host-Microbe Interface"

The Crawford laboratory focuses on Metabolism at the Human-Microbe Interface. High-throughput genome sequencing of bacteria (and fungi) has revealed many highly unusual “orphan” biosynthetic gene clusters suspected of synthesizing novel, structurally diverse, and biologically active small molecules. These types of naturally produced molecules often regulate complex interactions with their animal hosts, hold a rich history of being utilized as human drugs, and serve as excellent molecular probes for identifying new drug targets for a wide variety of diseases. Using a blend of small molecule chemistry, protein biochemistry, cell biology, and microbiology, the lab exploits the natural interactions between bacteria and animals to discover new molecules with signaling, antimicrobial, immunomodulatory, and anticancer activities. The lab also connects these products to their underlying biosynthetic genes, characterizes the biosynthetic enzymes involved in their construction, and investigates their roles in biology and medicine. In this lecture, I will present a simplified framework for decoding host-microbe molecular interactions using examples from the lab and then dig more into the microbiome’s role in colorectal cancer pathogenesis.

Jason Crawford, Ph.D.,  
Associate Professor of Chemistry and Microbial Pathogenesis,  
Yale University

# BONUS SEMINAR WEEK

## DISTINGUISHED SPEAKER SEMINAR SERIES IN INFECTIOUS DISEASE

Monday, April 17th at 2:00 pm

Fralin Hall Auditorium



### CRYPTOCOCCUS CELL WARS: THE ULTIMATE BATTLE BETWEEN HOST AND PATHOGEN

**Kirsten Nielsen, PhD**

Professor, University of Minnesota

Thursday, April 20th at 3:00 pm

220 Price Hall



### POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) ALTER COVID-19 PATHOGENESIS IN MICE.

**Shannon Ronca, PhD**

Assistant Professor,  
Baylor College of Medicine

Seminar is co-sponsored by  
CeZAP & Entomology Department

DISTINGUISHED SPEAKER SEMINAR SERIES  
IN INFECTIOUS DISEASE



THE POLINTOVIRUS PUZZLE: USING  
METAGENOMICS TO UNLOCK HIDDEN  
VIRUSES IN PROTISTS

Christopher Bellas

University of Innsbruck

Thursday, April 27 at 12:30pm

Virtual Seminar

<https://virginiatech.zoom.us/j/89419666443>



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