

**BIOMEDICAL & VETERINARY SCIENCES
GRADUATE PROGRAM**



ANNOUNCES

The Doctor of Philosophy Seminar and Examination of

Kelly C. Freudenberger Catanzaro

**“Surface Polysaccharides of Francisella tularensis:
Further Characterization, Role in Virulence, and
Application to Novel Vaccine Strategies”**

Wednesday, March 27th, 2019

1:00PM

VMCVM, Classroom 125

Bio



Kelly was born and raised in Elkton, Maryland where she cultivated her love for animals and veterinary medicine. She attended the University of Maryland where she earned a Bachelor of Science degree in Animal Sciences and a Bachelor of Science degree in Biology. She also participated in the 4 year interdisciplinary research program Gemstone where she worked with a team of other undergraduates on evaluating environmental enrichment for captive felids at the Smithsonian National Zoo. This program helped increase her interest in possibly pursuing research in addition to veterinary medicine. Kelly joined Dr. Inzana's lab in the summer of 2012 after being accepted to the Dual Degree PhD/DVM program at the VMCVM. In Dr. Inzana's lab, Kelly studied the extracellular polysaccharides of *Francisella tularensis*. She is currently in her 4th year of the DVM program where she is a small animal tracker. Kelly will continue her career in veterinary medicine as a Small Animal Rotating Intern at MedVet Akron with the hopes of eventually starting a residency in small animal medicine.

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Lay Language Abstract

Francisella tularensis is a highly infectious bacterial pathogen that can cause disease in a wide array of animals and in humans. *F. tularensis* is also considered a potential weapon of bioterrorism and the development of an effective vaccine is a critical area of research. One strategy of developing a tularemia vaccine includes mutating a strain of *F. tularensis* to reduce expression of extracellular components that include polysaccharides. Strains that cannot express these components are usually unable to produce clinical signs in the host and may provide protection against the fully virulent *F. tularensis*. The work presented in this dissertation will focus on characterizing the polysaccharide extracellular components of *F. tularensis* and developing a novel vaccine vehicle to increase protection from strains that do not cause disease.

Publications

Freudenberger Catanzaro KC, Lahmers K, Allen IC, Nasim A, and Inzana TJ. (2019) Alginate Microencapsulation of an Attenuated O-Antigen Mutant of *Francisella tularensis* LVS as a Model for a Vaccine Delivery Vehicle. (*Manuscript in Preparation*)

Freudenberger Catanzaro KC and Inzana TJ. (2019) The *Francisella tularensis* Polysaccharides: A Search for the Real Capsule. (*Review Manuscript in Preparation*)

Champion AE, **Freudenberger Catanzaro KC**, Inzana TJ. (2019) Biofilm formation by *Francisella tularensis* is dependent upon cell surface glycosylation, growth medium, and a glucan exopolysaccharide. *Scientific Reports*. (In Review)

Freudenberger Catanzaro KC, Champion AE, Mohapatra N, Cecere T, and Inzana TJ. (2017) Glycosylation of a Capsule-like Complex (CLC) by *Francisella novicida* is Required for Virulence and APrtial Protective Immunity in Mice. *Front. Microbiol.* 8:935. Doi: 10.3389/fmicb.2017.00935

Presentations

Freudenberger Catanzaro KC, Nasim A. Inzana TJ. 2018. Alginate Microencapsulation of an Attenuated O-Antigen Mutant of *Francisella tularensis* LVS as a Model for Vaccine Delivery Vehicle. Oral presentation at the American Society of Microbiology BioThreats Pre-Symposium Meeting in February 2018.

Freudenberger Catanzaro KC, Nasim A. Inzana TJ. 2018. Alginate Microencapsulation of an Attenuated O-Antigen Mutant of *Francisella tularensis* LVS as a Model for Vaccine Delivery Vehicle. Poster presentation at the American Society of Microbiology BioThreats Meeting in February 2018.

Freudenberger Catanzaro KC, Inzana TJ. 2017. Vaccine Efficacy of an Alginate Microencapsulated Attenuated Mutant of *Francisella tularensis* LVS Lacking the O-Antigen. Poster presented at the 2017 Summit of the Virginia Academy of Science, Medicine, and Engineering on Emerging Infections and Preparedness.

Freudenberger Catanzaro KC, Inzana TJ. 2017. Vaccine Efficacy of an Alginate Microencapsulated Attenuated Mutant of *Francisella tularensis* LVS Lacking the O-Antigen. Poster presented at the Mid-Atlantic Microbial Pathogenesis Meeting in February 2017.

Champion A, **Freudenberger KC**, Inzana TJ. 2015. Interference of Biofilm Formation by Lipopolysaccharide O-antigen and the Capsule-like Complex of *Francisella tularensis*. Poster presented in absentia at the 2015 Federation of European Microbiological Societies.

Freudenberger KC, Champion A, Mohaptra N, Cecere T, and Inzana T. 2015. Identification and Characterization of the Glycosylated Capsule-like Complex of *Francisella novicida*. Oral presentation at the 2015 Mid-Atlantic Microbial Pathogenesis Meeting.

Freudenberger KC, Champion A, Mohaptra N, Cecere T, and Inzana T. 2014. Identification and Characterization of the Glycosylated Capsule-like Complex of *Francisella novicida*. Oral presentation at the 2014 Annual Virginia Branch American Society for Microbiology Meeting.

Freudenberger KC, Champion A, Inzana T. 2014. Identification and Characterization of the Glycosylated Capsule-like Complex of *Francisella novicida*. Poster presentation at the 2014 National Meeting for the American Society of Microbiology.

Awards and Academic Achievements

Stamps Biomedical and Veterinary Science Scholarship, VMRCVM, 2016 – 2019
Tyler J & Frances F Young Scholarship, VMRCVM , 2015 – 2019
Stamps Fellow at VMRCVM, 2012 – 2019
WVC 2018 Dr. Jack Walther Leadership Award, 2018
Service to SCAVMA Award, 2018
Mid-Atlantic Microbial Pathogenesis Meeting Travel Grant, 2013, 2015, 2017
Southwest Virginia Veterinary Medicine Association Leadership Award, VMRCVM, 2017
Herman and Mildred Corder Scholarship, VMRCVM, 2015
Conan W. Vaughan, Jr. Scholarship, VMRCVM, 2015

Examination Graduate Committee

Major Advisor/Chair:

Thomas J Inzana, PhD
Professor and Associate Dean for Research
College of Veterinary Medicine, Long Island University

Graduate Advising Committee Members:

Clayton C Caswell, PhD
Assistant Professor
Department of Biomedical Sciences & Pathobiology

Mark D Freeman, DVM, Diplomate ABVP
Assistant Professor
Department of Small Animal Clinical Sciences

Jennifer L Hodgson, BVSc, PhD, MRCVS, Diplomate ACVM
Professor & Associate Dean for Professional Programs
Department of Population Health Sciences

External Examiner

David Thanassi, PhD

Professor and Chair
Center for Infectious Diseases
Department of Molecular Genetics & Microbiology
Stony Brook University

"Metabolic Control of Outer Membrane Vesicle and Tube Formation
by Francisella."
March 27, 2019
9AM
VMIA, Room 220



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