

**BIOMEDICAL & VETERINARY SCIENCES
GRADUATE PROGRAM**



ANNOUNCES

The Doctor of Philosophy Seminar and Examination of

Telvin L. Harrell

**“Ubiquitin Targets and Molecular Mechanisms of
Herpes Simplex Virus 1 in Adult Sensory Neurons”**

Thursday, September 15th, 2022

10:30AM

ILSB Room 1040



Bio

Telvin's passion for biology began as a child as he showed interest in everything from insects to fish, reptiles, dogs, and cats. As he progressed through high school and college, his interests centered around molecular biology and infectious diseases. Telvin earned his BS in Cellular, Molecular, and Physiological Biology from Christopher Newport University in Newport News, Va. After his bachelor's, he completed an internship at Virginia Tech Multicultural Academic Opportunities Program (MAOP), studying “Neurotrophic Factor Deprivation for Herpes Simplex virus” in the lab of Dr. Andrea Bertke. He later returned to the Hampton Roads area of Virginia, where he earned a graduate certificate in Molecular Diagnostics and an MS from Old Dominion University in Norfolk, Va., studying Zika infection in arthropods. Deciding to pursue a Ph.D., Telvin returned to Virginia Tech in the lab of Dr. Andrea Bertke to continue studying herpes simplex virus. His research focuses on the intracellular mechanisms of Infected Cell Protein 0 and HSV1 in primary adult sensory neurons through proteomic-based assays. Upon completing his Ph.D., Telvin will begin work as an ORISE fellow with the United States Department of Agriculture.

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Lay Language Abstract

Herpes simplex virus (HSV1) is a large DNA virus that infects more than 50% of the human population. Symptoms of infection are herpetic lesions, or cold sores, that appear in response to stress in or around the mouth, nose, and eyes. The lesions are often considered minor inconveniences, not requiring medical intervention. Still, in some instances, HSV1 can cause more severe complications, such as an ocular infection leading to herpetic keratitis, a leading cause of blindness. HSV1, as a pathogen, is unique in that, unlike other self-limiting pathogens, HSV1 can persist within the host by establishing a quiescent state called latency within the neurons of peripheral ganglia. This latent state allows the virus to remain with the host for life and reactivate periodically to cause recurrent disease. Despite the commonality of infection, the mechanisms that facilitate replication, latency, and reactivation in neurons are unclear. My work focuses on how HSV1 productively infects, establishes latency, and reactivates within adult sensory neurons. I specifically study Immediate Early Protein 0 (ICP0), a viral protein that facilitates viral establishment within the host cell. ICP0 is an E3-ubiquitin ligase that is known to target host proteins for degradation, alter cell signaling, and modify the host cell proteome making it more susceptible to viral infection in non-neuronal cells. Within neurons, where HSV1 can establish latency, ICP0 engages in complex protein-protein interactions with host proteins that are largely unknown. Through my research, I aimed to identify some of these interactors using nano-liquid chromatography coupled to tandem mass spectrometry to illuminate the mechanisms that facilitate HSV1 infection in adult sensory neurons. The work presented here provides new insight into the establishment of HSV1 latency in adult sensory neurons and illuminates some of the mechanisms that facilitate reactivation.

Publications

Herpes Simplex Virus 1 (HSV-1) Infected Cell Protein 0 (ICP0) Targets of Ubiquitination during Productive Infection in Primary Adult Sensory Neurons

Presentations

Harrell T, Goswami P, Bertke AS. Herpes Simplex Virus Modulates Wnt-Beta Catenin Signaling Cascade in Primary Adult Sensory Neurons. VT Alliance for Neurodevelopment Research Symposium, 2022 (Poster Presentation)

Harrell T and Bertke AS. Proteomic Analysis of HSV1 in Dorsal Root Ganglion Neurons. American Society of Virology, 2021 (Poster Presentation)

Harrell T and Bertke AS. Infected Cell Protein 0 (ICP0) and Latency Associated Transcript (LAT) coordinate to facilitate HSV Reactivation in Adult Sensory Neurons, International Herpesvirus Workshop, 2019 (Poster Presentation)

Examination Graduate Committee

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