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Education

Ph.D., Biochemistry and Molecular Biology, The George Washington University

Key Interests

Infectious Diseases | Host Response | Proteomics | Nanotechnology | Diagnostics | Small Molecule Inhibitors | Venezuelan equine encephalitis virus | Rift Valley fever virus

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SELECT PUBLICATIONS

- A. Baer *et al.*, Venezuelan equine encephalitis virus induces apoptosis through the unfolded protein response activation of EGR1. *J Virol.* 90 (2016).
- N. Shafagati *et al.*, Enhanced detection of respiratory pathogens with nanotrap particles. *Virulence*. 7, 756–769 (2016).
- T. M. Bell *et al.*, Rapamycin modulation of p70 S6 kinase signaling inhibits Rift Valley fever virus pathogenesis. *Antiviral Res.* 143, 162–175 (2017).
- B.D. Carey *et al.*, Protein phosphatase 1α interacts with Venezuelan equine encephalitis virus capsid protein and regulates viral replication through modulation of capsid phosphorylation. *J Virol*. 92 (2018).

Research Focus

Arboviruses including Rift Valley fever virus (RVFV), Venezuelan equine encephalitis virus (VEEV), and Zika Virus rank high in their potential for having a large health and economic impact. These viruses cause emerging infectious diseases and are all transmitted by arthropod vectors. RVFV is endemic to Africa, but has the potential of being introduced into the United States and becoming established in the mosquito population, very much like what happened in the case of West Nile virus. Despite being recognized as emerging threats, relatively little is known about the virulence mechanisms of these viruses and there are currently no FDA licensed vaccines or therapeutics available. In addition, diagnostic assays are limited for these agents.

My laboratory is focused on 1) identifying critical host factors that are necessary for viral replication and/or pathogenesis, 2) evaluating small molecule inhibitors that target essential host-based events for their therapeutic potential and 3) developing novel diagnostic tools to enable the early detection of viral infections.

Current Projects

- Elucidation of Early Growth Response 1 (EGR1) regulation of neuronal survival and inflammation following VEEV infection
- Creation novel diagnostic assays using Nanotrap ® particles, which capture and enrich virus at low viral titers, and protect viral RNA from degradation, eliminating the need for cold chain transport of diagnostic samples
- Evaluation of FDA-approved kinase inhibitors Rapamycin and Sorafanib for novel RVFV and VEEV treatment
- Utilization of proteomic approaches to identify viral protein interactomes and viral protein phosphorylation events