

Thesis Defense Announcement
To: The George Mason University Community

Candidate: James L. Erickson
Program: MS in Biology

Date: July 1, 2022

Time: 3:00 PM Eastern Time

Zoom Link: <https://gmu.zoom.us/j/97530066993?pwd=dWdNQkRjCHJwMG9FWGJaaXA5T2VTZz09>

Title: [The Characterization of RNAs in Extracellular Vesicles Released from Coronavirus Infected Cells](#)

Committee Chair: Dr. Fatah Kashanchi

Committee Members: Dr. Lance Liotta, Dr. Amanda Still

All are invited to attend the defense.

ABSTRACT:

In late 2019, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) emerged from Wuhan, China, and reached pandemic levels of spread within a few months. Being the causal agent of a pneumonia-like respiratory infection, coronavirus disease 2019 (COVID-19), which has killed 6,266,459 people worldwide as of May 10, 2022 as reported by John Hopkins University. SARS-CoV-2 is considered to be a BSL-3 agent due to the high transmissibility via aerosolized droplets, therefore limits the facilities that can effectively conduct research with this virus. Coronavirus replication has two unique functions, 1) the use of discontinuous replication to create subgenomic mRNAs (sgmRNAs) and 2) the use of double membrane vesicles (DMV) where genomic and subgenomic replication occurs. Extracellular vesicles (EVs) can shuttle viral proteins and RNAs throughout the body. Our study has characterized EVs produced from HCoV-OC43, a BSL-2 level betacoronavirus, infected cells to evaluate how betacoronaviruses influence the release of EVs. We found that EVs released from HCoV-OC43 infected cells contained viral proteins and sgmRNAs which encode for structural proteins critical for virion formation.