



## GRADUATE RESEARCH SEMINAR SERIES

Friday  
April 14, 2017

12:15 PM

Research Pavilion  
NSTC  
Conference Room 169

*Pizza and drinks  
will be provided*

### A Nanoparticle-Enabled Blood Test for Active Viral Infection Detection

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Rapid detection and diagnosis of acute viral infections is critical for infectious disease control. Traditional diagnostic virology faces many limitations and challenges. In general, a typical acute viral infection should follow a multi-stage process in which viral antigen and virus-specific antibody each reach peak values at different time points. Detection of viral antigen alone can lead to false negative results in patients who have already passed early stages of infection, when viral titers typically peak. Meanwhile, serological testing for the presence of virus-specific antibody cannot alone determine if an infection occurred recently or in the past, as virus-specific antibodies persist long after the virus is cleared. In the current work, we have developed a novel blood test based on D2Dx (from diameter to diagnostics) assay technology for rapid detection of acute viral infection. During our preliminary study, we have investigated the immune response of wild-type H-2<sup>b</sup> mice following infection with a low dose of mouse-adapted A/PR8 influenza A virus. The results of our D2Dx assay have revealed that it can detect only active immune response following an acute viral infection, in comparison with tradition ELISA (enzyme linked immunosorbent assay) methods. This test is extremely easy to perform, only requires a few drops of blood sample, with results obtained in minutes. In addition, this test does not require the identification of the specific pathogen that caused the infection. Consequently, it might be used as a fast-response, universal screening tool during pandemic or epidemic breaks.

