



HOVDE DISTINGUISHED LECTURE

DR. RICHARD KUHN

The Trent and Judith Anderson Distinguished Professor in Science

"Pandemic Preparedness for Envelope Viruses"

Monday, February 27, 2023

Reception - 3:00 - 3:45 PM, HOCK Atrium

Lecture - 4:00 PM, MJIS 1001

The last three years have demonstrated the impact of a novel viral pathogen to disrupt our lives, the economy, and global affairs. Such an event has been predicted by infectious disease scientists for many years. Furthermore, the last few decades have seen the emergence of numerous new pathogens with potential to disrupt society. The National Institute of Allergy and Infectious Disease (NIAID) is charged with preparing for such outbreaks of new and re-emerging pathogens. Eight groups of viruses are currently targeted for research to prepare for their pandemic potential. My laboratory has been using tools of molecular virology and structural biology to understand three of these virus groups. This lecture will focus on understanding how the B cell component of our immune system is responding to the enveloped viruses that we study. Isolation of human monoclonal antibodies that react with and neutralize virus infectivity have been isolated for numerous pathogenic viruses. Specific antibodies from these groups are biochemically prepared for cryo-electron microscopy studies in complex with their cognate virus. High-resolution structures of viruses and complexes with antibodies reveal the precise interaction and binding of the antibodies and can reveal the mechanism by which they inactivate these invading viruses. Analyses of these structures provide guidance for future vaccine development and use of these antibodies for therapeutic purposes. Thus, these studies provide foundational insights into prophylactic and post-infection interventions.