COMBATTING FUTURE BIOLOGICAL THREATS – HOST-DIRECTED INTERVENTIONS TO EMERGING THREATS FOR RAPID RESPONSE

High Resolution Antibody Profiles For Evaluating Vaccine Platforms And Identifying Antigens

Jason Ladner Northern Arizona University **Evan Elko** Northern Arizona University **Heather Mead** TGen **Georgia Nelson** TGen **Jorge Soria-Bustos** TGen **John Altin** TGen **Paul Keim** Northern Arizona University

Antibodies are an incredibly diverse population of immune proteins that are generated in response to infections. They have been shown to serve as strong correlates of protection for a wide variety of pathogens, and they are also important biomarkers for past infection events. However, traditional serology assays (e.g., ELISAs) are incommensurate with the diversity of an individual's antibody response because they only measure reactivity against a single antigen at a time and generate a composite measure of antibody binding across many distinct epitopes. In contrast, modern approaches for "highly-multiplexed" serology are allowing us to measure antibody responses with unprecedented breadth and resolution. This is because these approaches can simultaneously measure antibody binding to 100,000s of antigens from 150 samples from mice vaccinated with 5 and 3 different platforms, respectively, and we have used these data to quantitatively compare antibody responses between platforms with epitope-level resolution. For the second component, we have measured antibody reactivity against the entire B. pseudomallei proteome in 92 humans with documented infections (and matching negative controls). Using these data, we have identified >10 novel antigens that are commonly targeted by human antibody responses to infection.

This work was supported by the Defense Threat Reduction Agency under the Rapid Assessment of Platform Technologies to Expedite Response (RAPTER) program (award no. HDTRA1242031). The authors would like to thank Dr. Traci Pals and Dr. Bob Webb for their support of this work.