Identification and Characterization of B Cell Epitopes in Human Lassa Fever

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Several members of the Arenaviridae, including Lassa virus (LASV), induce severe and sometimes fatal hemorrhagic fevers and are classified as Biosafety Level 4 (BSL-4) agents. Arenaviruses have relatively stable virions, do not require passage via insect vectors, and are transmitted easily by human-to-human contact. Lassa fever has proven to be a significant health problem for Nigeria, Liberia, Sierra Leone, and the Republic of Guinea. Currently, there are no approved vaccines or therapeutic treatments for combating Lassa virus infection. Also, the pathogenesis of Lassa fever is poorly understood and a better understanding is needed to authenticate an animal model system. Interactions between the virus and the innate immune system are important to determining the effect of virus infection. We hope to identify novel B cell epitopes on LASV proteins to possibly reveal a mechanism of antibody-mediated protection for humans infected with LASV. Our first approach is to create overlapping synthetic peptides 20-30 amino acids in length which span the entire sequence of both the LASV GPC and NP genes. These peptides are fixed to wells of ELISA plates and used to further determine binding specificity of LASV specific mAbs. The next approach to identifying B cell epitopes in human Lassa fever will be to employ the ProCode screening technology. This is a unique approach to screening a synthetic antibody library which we will use to select for epitopes that bind and neutralize LASV specific mAbs. Hopefully, using these methods, we will generate a panel of epitopes that will illuminate new mechanisms to provide antibody-mediated protection in humans infected with LASV.