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Michelle Lam Advisor(s): Thomas Postler

Unveiling Mucosal Secrets: Optimizing Hamster Assays for Immune Research

The mucosal immune system is a vital defense mechanism that safeguards the body against pathogens and antigens. It comprises an intricate network of tissues and cells spread across mucosal surfaces. Leveraging the mucosal immune system to elicit targeted immune responses with intranasal vaccines offers a promising strategy to reduce meaningful replication and, therefore, prevent infection and reduce transmission. The Vesicular Stomatitis Virus (VSV) vaccine platform used in our studies is significant because it elicits highly immunogenic responses. The VSV platform is also very adaptable to the expression of various antigens, making it suitable for developing vaccines against a range of pathogens. By delivering vaccines directly to the respiratory mucosa, we can capitalize on the potential to induce robust mucosal immune responses at the very site where pathogens initiate infection. To facilitate the study of whether intranasally administered VSV-based vaccine vectors can elicit specific mucosal responses, optimizing the Golden hamster (Mesocricetus auratus) model is imperative due to the limited availability of reagents specific to this model. Our objectives involve optimizing a hamster IgA-specific ELISA, evaluating different ELISA and ELISpot kits, developing an antibody panel for flow cytometry, and addressing the limited availability of hamster antibodies by employing RT-qPCR. In this study, we successfully optimized a hamster-specific IgA ELISA. Furthermore, we established robust RT-qPCR protocols for Cd4, Cd8, Cd14, Il1b, Il2, Il4, Il6, Il10, Il13, Tnf, Ifng, Irf1, Isg15, Ccl3 and Cxcl10 expression in hamster samples. Regarding the ELISA kits, the Mabtech hamster ELISA kit proved effective in detecting IFN-γ, yielding significant signals, and the IFN-γ ELISpot kit also detected IFN-γ. Additionally, we have developed an antibody panel including Cd4, Cd8, Cd45, and MHC2 for flow cytometry.