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Safety and protective efficacy of respiratory syncytial virus-like particles in a murine model

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Respiratory syncytial virus (RSV) is the leading cause of severe respiratory infections in children worldwide, particularly bronchiolitis and pneumonia. Most children be infected with RSV by the time they reach the age of 2, with incidence rates higher during early months of infancy. It is estimated that in the United States, an average of about 58,000 children under the age of 5 are hospitalized due to RSV each year. To this day, there is still no licensed vaccine. In this study, we evaluated the safety and efficacy of monophosphoryl lipid A (MPLA)-adjuvanted RSV virus-like particles (RSV VLPs) that express the F and G surface proteins and the M matrix protein, in a murine model. F is a crucial protein in RSV vaccine development because it contains neutralizing epitopes that can be targeted by neutralizing antibodies. We conducted an *in vivo* analysis by immunizing BALB/c mice with diluent, RSV, MPLA-adjuvanted RSV VLPs, or non-adjuvanted RSV VLPs. Our results indicated that two intramuscular immunizations of the MPLA-adjuvanted RSV VLPs elicited a strong neutralizing antibody response. It also showed that immunization induced a RSV-specific IgG response and higher IgG2a levels compared to IgG1 which suggested a Th1-biased response. MPLA-adjuvanted RSV VLPs were also able to protect mice from RSV infection in the upper and lower respiratory tracts and the development of disease in the lungs based on the histopathology of the lungs. Our findings thus far lead us to conclude that using MPLA-adjuvanted RSV VLPs is a promising candidate for a RSV vaccine.

Biography:

Micah Tepora has B.S. in Biological Sciences from Loyola University. Her research interest is infectious diseases. She has completed her M.S. Tropical Medicine from University of Hawai'i at Manoa.