2342. Evaluation of mRNA-LNP and adjuvanted protein SARS-CoV-2 vaccines in a maternal antibody mouse model

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**Background.** Maternal antibodies (matAbs) protect against a myriad of pathogens early in life; however, these antibodies can also inhibit de novo immune responses against some vaccine platforms. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) matAbs are efficiently transferred during pregnancy and protect infants against subsequent SARS-CoV-2 infections. It is unknown if matAbs inhibit immune responses elicited by different types of SARS-CoV-2 vaccines.

**Methods.** We established a mouse model to determine if SARS-CoV-2 spike (S)-specific matAbs inhibit immune responses elicited by recombinant protein and nucleoside-modified mRNA-lipid nanoparticle (mRNA-LNP) vaccines. Mouse dams were vaccinated with SARS-CoV-2 S protein-encoding mRNA-LNP vaccine (or vehicle) in early pregnancy and pups were born and matAbs quantitated in pup serum by ELISA. Pups with and without matAbs were vaccinated at weaning with recombinant S protein (adjuvanted with Addavax or empty LNP) or mRNA-LNP and serum S-specific IgG quantitated over time.

**Results.** S-specific matAbs were transferred to pups and decayed over time as expected. We found that SARS-CoV-2 mRNA-LNP vaccines elicited robust de novo antibody responses in mouse pups in the presence of matAbs. Recombinant protein vaccines were also able to circumvent the inhibitory effects of matAbs when co-administered with Addavax or empty LNP as adjuvants.

**Conclusion.** While additional studies need to be completed in humans, our results raise the possibility that mRNA-LNP-based and adjuvanted protein-based SARS-CoV-2 vaccines have the potential to be effective when delivered in the presence of matAbs.

**Disclosures.** Reihaneh Hosseinzadeh, MASc, Acuitas Therapeutics: Employee. Drew Weissman, MD, PhD, Intellectual Property/Patents: D.W. is named on the first patent describing nucleoside-modified mRNA and on patents describing its use as a treatment and vaccine platform. Scott Hensley, PhD, Intellectual Property/Patents: SEH is named on patents that describe the use of nucleoside-modified mRNA as a platform to deliver therapeutic proteins and as a vaccine platform.