

Linda J. Saif, PhD Distinguished University Professor Food Animal Health Research Program (CFAES, OARDC) and the Veterinary Preventive Medicine Department COVID-19 Immunity and Vaccines: Unknowns and The Role of Mucosal Immunity

Dr. Linda J. Saif is a Distinguished University Professor at The Ohio State University (OSU) in the Food Animal Health Research Program (CFAES, OARDC) and the Veterinary Preventive Medicine Department (CVM, OSU). She is a virologist and immunologist, whose research focuses on comparative aspects of enteric and respiratory viral infections (coronaviruses, rotaviruses and caliciviruses) of food animals and humans. Her lab studies mucosal immunity and vaccine development and is currently focusing on the impact of malnutrition and micronutrient deficiencies (vitamin A) on vaccines and interactions of probiotics and the gut microbiota with the neonatal immune system, vaccines and viral pathogenesis. Dr. Saif's coronavirus research spans 4 decades and includes her MS and PhD research on swine coronaviruses, immunity and vaccines. Dr. Saif is known nationally and internationally for her work on enteric and respiratory viruses (rotaviruses, caliciviruses and coronaviruses) that affect food producing animals, wildlife, and humans [Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS)] and their zoonotic potential and mechanisms of interspecies transmission. Dr. Saif was an advisor to the WHO and CDC during the 2003 SARS outbreak and her laboratory is a WHO International Reference Lab for Animal coronaviruses in the SARS network. She was an advisor to the Ministry of Agriculture in Saudi Arabia on MERS in camels and control strategies. She is a member of the US National Academy of Sciences since 2003. During the COVID-19 pandemic, she is providing One Health expertise about the SARS-CoV-2, including diagnostics, interspecies transmission, vaccines and control strategies. Dr. Saif holds 5 US/foreign patents and has authored or coauthored over 400 referred journal publications and 78 book chapters pertaining to her research.

Abstract: SARS-CoV-2 infects mucosal sites including the oropharynx, upper and lower respiratory tract and in some cases the gastrointestinal tract. Understanding the pathogenesis of COVID-19, including mucosal infection and shedding profiles, and the induction and longevity of mucosal immunity at the infection sites as related to disease severity, age, etc will aid in control measures and vaccine design.

Accordingly the objectives are:

- •. Understand basic characteristics of CoVs
- Appreciate the diversity and ecology of CoVs, host reservoirs and interspecies transmission to humans and animals

•. Clarify unique aspects of mucosal immunity focusing on secretory IgA and mucosal B cell trafficking patterns

•. Provide a perspective on mucosal infection by SARS-CoV-2 and induction of mucosal immunity at the sites of infection, including memory responses

 Identify unknowns/gaps in our understanding of immunity/mucosal immunity to COVID-19 and vaccines