

Recognizing Bovine Viral Diarrhea Virus

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Bovine viral diarrhoea virus (BVDV) is a viral agent responsible for a broad spectrum of illnesses in cattle. The virus is distributed across the globe, and brings with it significant economic consequences due to the shortened life spans and reduced productivity it imparts upon the animals it infects. The primary means of controlling the infection at present is through vaccination. However, due to the rapid evolution and substantial diversity of the virus, vaccination has been challenging. This project aims to investigate the molecular components of this virus that produce natural immune responses in cattle, in order to better inform how our vaccines are designed. The immune system of a cow, much like that of humans, relies on discrete molecular patterns, or epitopes, to identify dangerous intruders present within the body. These epitopes are the molecular shortcuts the immune system relies upon to identify and eliminate threats. It is the case with BVDV, like with many viruses that the epitopes identified by the immune system can vary widely across the different strains of BVDV. This makes it challenging to develop a broadly protective immune response to the virus, both naturally, and with the aid of vaccination. This project will employ sophisticated, state of the art methodology to identify and describe the epitopes of BVDV, with the hopes of using these insights to design safe and effective vaccines to combat the global problem of BVDV.