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Présentation par affiche (poster)

Development and use of a microarray-based diagnostic tool for the detection of novel viruses involved in swine emerging diseases

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Today, emerging and re-emerging diseases represent a constant threat to the swine industry. Current diagnostic methods, such as immunological assays and PCR, are known as powerful tools to identify viruses. However, these methods are hindered by limitations such as a high specificity to a narrowed set of viruses. Thus, a priori knowledge of the viral pathogen suspected in a clinical case is required to select the proper detection method. Since the pathogen(s) implicated in a new disease is unknown, the detection process can become long and tedious. For these reasons, the development of a new method for the identification of novel viruses is needed. Our laboratory is currently developing a DNA microarray to be used as a screening test for unknown viral etiologic agent. This DNA micro-array is built with highly conserved DNA sequences within each viral family. With this technology, all strains of each virus family, including cryptic or newly porcine viral variants, should be detectable. To test and validate the technology, a preliminary viral DNA-chip has been developed in our laboratory with 200 different probes, targeting 6 swine viruses (porcine respiratory coronavirus, transmissible gastroenteritis virus, swine influenza virus [SIV], porcine reproductive and respiratory syndrome virus [PRRSV], porcine parvovirus and porcine circovirus [PCV]). With this preliminary viral DNA chip, tests were done to validate the amplification and hybridization methods, and to check the specificity of each probe used. Preliminary results indicate a high specificity of our probes to each virus tested (PRRSV, PCV and SIV). Interestingly, the viral DNA chip was able to detect an unrelated H7N7 equine influenza virus strain within a tested sample. This sample was also positive for a family of viruses unknown to infect horses, illustrating the usefulness and the power of this technology. Experiments are underway to identify and characterize this new virus.