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Development and application of a high sensitivity immunochromatographic test strip for detecting classical swine fever virus antibody

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Abstract

Classical swine fever (CSF) is caused by classical swine fever virus (CSFV) and has led to huge ecnomic losses for the pig industry worldwide. Although vaccination and other control measures have been carried out, it is essential to establish a rapid and valid method for CSF vaccination monitoring and clinical diagnosis. CSFV E2 protein has been well-known as a major antigen for antibody detection. It is significant to improve affinity between E2 protein and CSFV antibody for a better performance of detection method. In this study, a recombinant E2 extracellular protein (aa 1-331), which has a native homodimer conformation and has a high affinity with anti-CSFV-E2 monoclonal antibody WH303, was expressed using Bac-to-Bac baculovirus expression system. A novel immunochromatographic test strip based on the recombinant CSFV E2 protein was developed for CSFV antibody detection. The sensitivity of this strip for detecting CSFV standard positive serum was 1:102400, 4 times higher than that of the previously developed CnC2 test strip. No cross reaction with antibodies of other swine viruses was observed. The detection of clinical swine serum samples (n=138) demonstrated that the agreements of this E2 test strip with three commercial ELISA kits were 88.40% (122/138), 86.23% (119/138), and 96.38% (133/138), respectively. Our data indicated that a novel E2 test strip with higher sensitivity has been developed and can be applied for clinical sample detections, providing a new powerful and simple approach for CSFV antibody monitoring.

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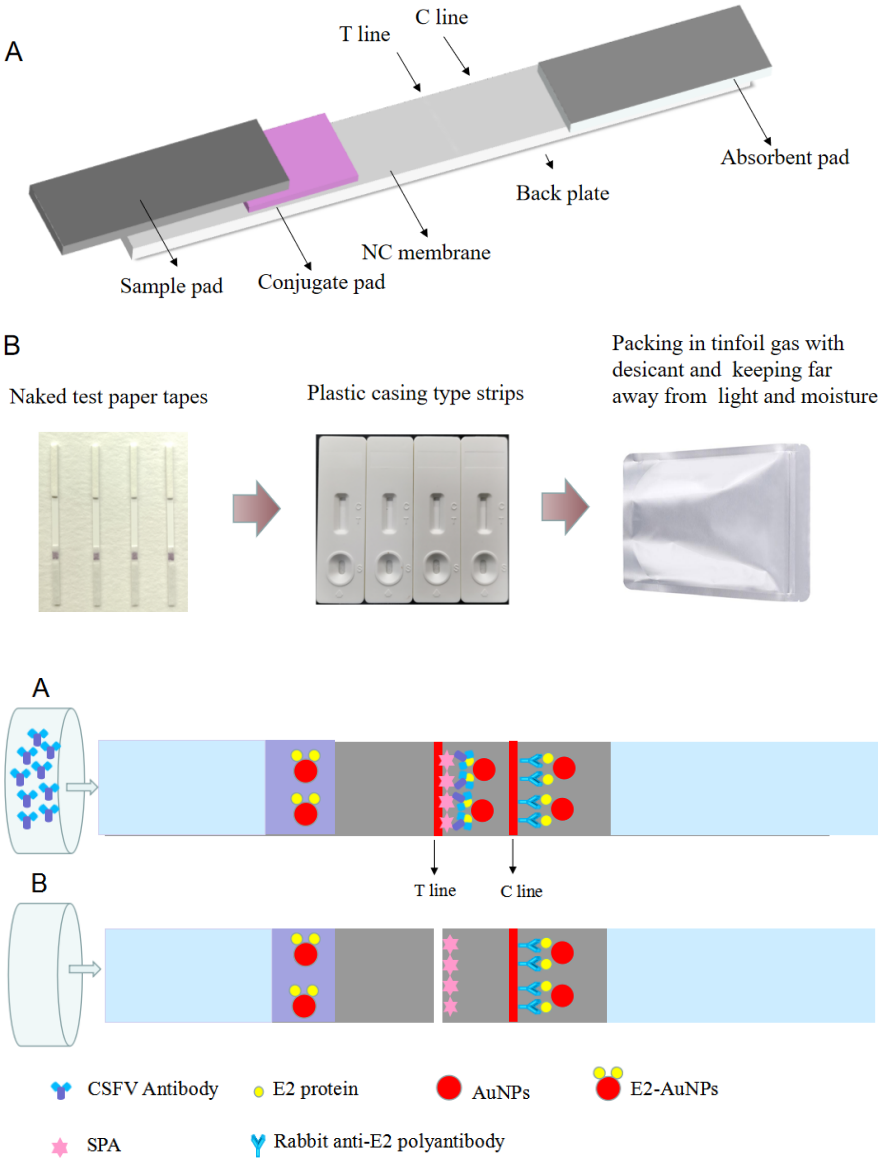

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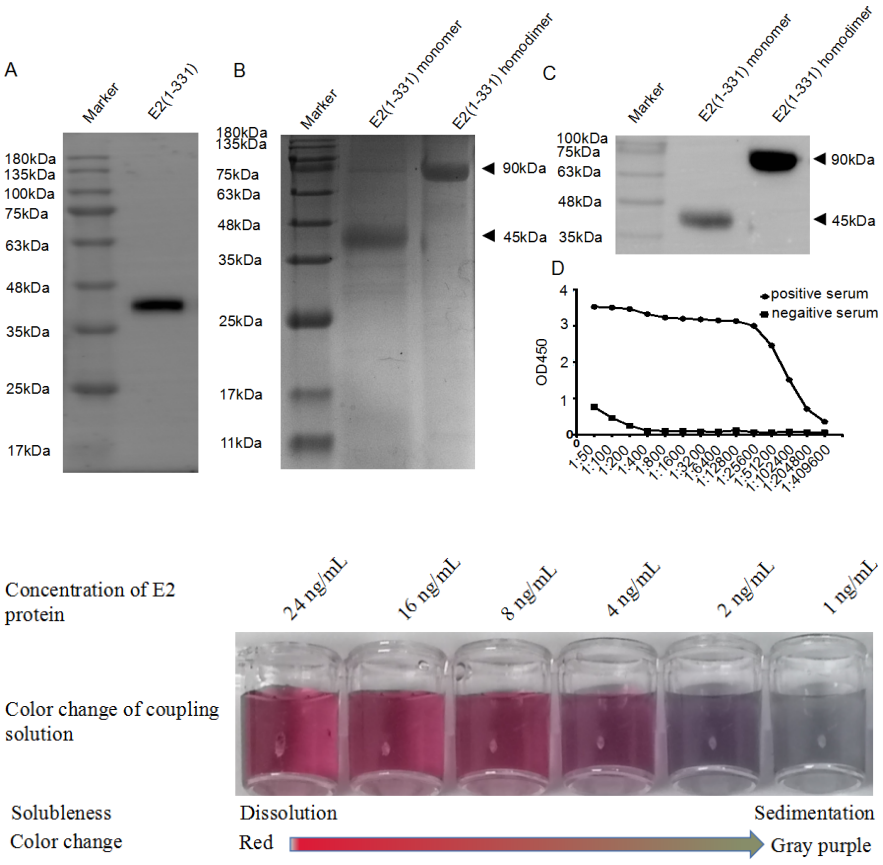

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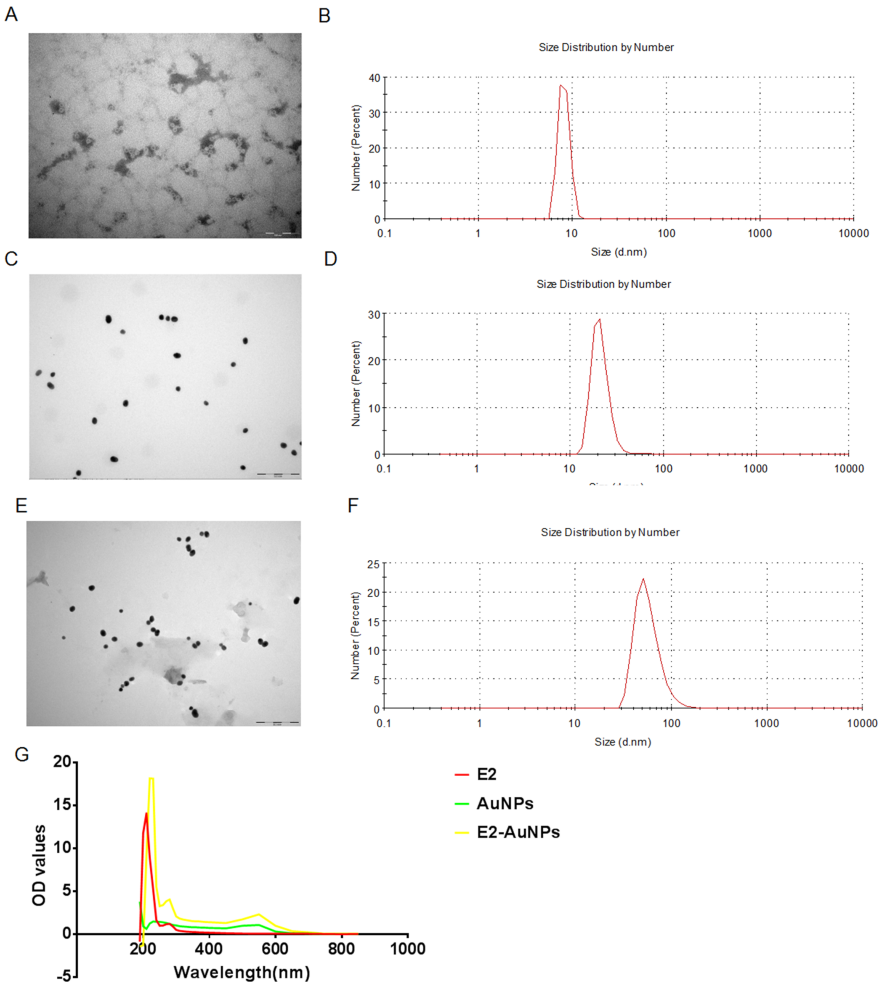

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