

Chicken single-chain variable fragments against the SARS-CoV spike protein

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摘要

Abstract

The major concern for severe acute respiratory syndrome (SARS), caused by the SARS-associated coronavirus (SARS-CoV), is the lack of diagnostic and therapeutic agents. Using a phage display technology in a chicken system, high-affinity monoclonal antibody fragments against the SARS-CoV spike protein were characterized. Ten truncated spike protein gene fragments were expressed in *Escherichia coli* cells. Following the immunization of chickens with these recombinant spike proteins, two single-chain variable fragment (scFv) antibody libraries were established with short or long linkers to contain 5×10^7 and 9×10^6 transformants, respectively. After four rounds of panning selection, the scFv antibodies of randomly chosen clones were demonstrated by Coomassie blue staining, and verified by western blot analysis. In a comparison of nucleotide sequences with the chicken germline gene, we found that all clones varied in the complementarity-determining regions, that two scFv antibodies reacted significantly with SARS-CoV-infected Vero cells, and that those two specific scFv antibodies recognized the same region of the spike protein spanning amino acid residues 750-1000. In conclusion, the results suggest that the chicken scFv phage display system can be a potential model for mass production of high-affinity antibodies against the SARS-CoV spike protein