

## Abstract

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**Project Code:**

**Project Title:** Interference of replication of porcine reproductive and respiratory distress virus (PRRSV) by swine scFv specific to the viral nonstructural protein-1

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**Abstract:**

Porcine reproductive and respiratory distress syndrome virus (PRRSV) infects swine and causes highly infectious disease, *i.e.*, porcine reproductive and respiratory distress syndrome (PRRS), which has enormous economic impact on the global swine industry. PRRSV infected sows causing reproductive failure while infected piglets and growing pigs are succumb severe respiratory problem. The infecting host has prolonged viremia and persistent infection indicating that the overall immune responses are incapable of completely eliminating the virus. Among 14 functionally different non-structural proteins (nsp), nsp1 is reported to be a multifunction protein containing 2 self-releasing proteins; nsp1 $\alpha$  and nsp1 $\beta$ . In this study, a phage library displaying porcine single chain antibody (p-scFv) fragments was successfully constructed using immunoglobulin genes of multiple pigs. Recombinant nsp1 $\beta$  protein of PRRSV was produced and used as a panning antigen for selecting phage clones that display nsp1 $\beta$  specific-p-scFv from the phage display library. Gene sequence coding for the nsp1 $\beta$  specific-p-scFv was molecularly linked to a DNA sequence coding for a cell penetrating peptide (CPP); Penetratin (PEN). The PEN-p-scFv was tested for their ability to hamper the PRRSV replication in infected MARC-145 cell. The infected MARC-145 cells treated with PEN-p-scFv no.5 has significantly lowest amount of infected foci when compare to control PEN-p-scFv, neutralizing pig serum, Poly:IC. The obtained PEN-p-scFv has potential activity for interfering with PRRSV replication. However, the molecular of inhibition should be further study in order to understand for treatment remedy discovery.

**Keywords :** PRRSV, nsp1, phage display scFv, cell penetrating peptide