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TITLE

IN-VITRO TESTING OF THE ANTIGENICITY AND SAFETY OF TWO NEWLY DEVELOPED IRRADIATED VACCINE CANDIDATES AGAINST HIGHLY PATHOGENIC PORCINE REPRODUCTIVE AND RESPIRATORY SYNDROME VIRUS 2

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CONTENT

Background and Objectives
Vaccination against PRRSV still remains unsatisfactory regarding efficacy and safety. In this study, we tested the in-vitro antigenicity and safety of highly pathogenic (HP) Porcine Reproductive and Respiratory Syndrom Virus (PRRSV) 2 irradiated in two different ways as potential vaccine candidates.
Material and Methods
An HP PRRSV 2 field strain, cultured in MARC 145 cells and concentrated by ultracentrifugation, was treated with low energy electron irradiation (LEEI) or gamma irradiation (with and without trehalose as stabilizer) at a dosage of 30 kGy. The inactivation has been tested by estimation of the viral load and TCID50 of live and irradiated viruses in cell culture for three passages. Electron microscopy has been performed to assess virus structure. The in-vitro antigenicity was measured by an in-house ELISA by coating wells of a microtiter plate with live and the irradiated viruses, respectively and testing them with known antibody positive and negative serum.
Results
After ultracentrifugation, the TCID50 of the live HP PRRSV 2 was 1E-6.75. A viral load of 6.6E+10 was measured. After irradiation, the viral load was 1.4E+10 and 1.1E+10 in gamma-irradiated virus (+trehalose) and 8.8E+9 in LEEI virus. No cytotoxic effect has been detected after irradiation. In electron microscopy, 63% of the non-irradiated virus particles were intact, whereas in irradiated viruses about 30% intact particles were found. In the ELISA, OD values in positive pig samples were above 1.5 and did not differ substantially between live and irradiated virus wells. In negative serum samples, OD values stayed beneath 0.3.
Discussion and Conclusion
Both gamma irradiation as well as LEEI, were able to safely inactivate the tested HP PRRSV 2 strain. The in-vitro antigenicity as well as the viral load of the irradiated viruses were comparable to the live virus. Testing the immunogenicity in pigs will be the next step.