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Comparative analysis of immunogenicity of Rift Valley fever virus glycoprotein Gc recombinantly expressed in different expression systems

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Background and objectives: Rift Valley fever virus (RVFV) is a mosquito borne virus, which is responsible for large outbreaks affecting human and a wide range of vertebrate hosts, especially ruminants throughout Africa and the Arabian Peninsula.

There are no drugs approved to date for the therapy of RVF in humans. One frequently discussed promising option is the application of neutralizing antibodies against RVFV infection.

Materials and methods: For generation of monoclonal antibodies BALB/c mice were immunized with the vaccine strain MP-12. Supernatants from generated hybridoma cells were screened by a newly established indirect immunofluorescence assay (IIFA). Neutralizing activities of reactive mabs were assessed using a serum neutralization test (SNT).

Furthermore a new protocol was established to generate single-domain antibody fragments against RVFV by immunization of Alpacas with MP-12 strain. Specific VHH were identified by phage display, followed by IIFA and subsequent assessment for neutralizing activity.

Results: One specific neutralizing mab could be identified, which displayed synergistic effects in combination with recently generated mab Gn3 .

Moreover 5 of 7 IIFA positive VHH showed neutralizing activities.

Conclusion: Antibodies with neutralizing activity against RVF were generated and will be further evaluated for in-vivo studies.