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Advanced phage display – perspective approach for preparing of *Francisella tularensis* monoclonal antibodies

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Aims: In recent years, the view of antibody-mediated immunity against intracellular pathogens has been relatively fully described. At the present time, there are no doubts about the antibody contribution in the protective immunity during the infection caused by *Francisella tularensis* (*F. tularensis*). It was described that polyclonal antibodies, as well as monoclonal antibodies are efficacious. The aim of this construed study is to demonstrate the application of phage display libraries for construction of monoclonal antibodies against *F. tularensis*. So prepared antibodies could be applicable for the alternative prophylaxis and possible therapy of infections caused by this pathogen.

Methods: The technique of phage display is used for producing antibody-like molecules. Gene segments encoding the antigen-binding variable of V domains of antibodies are fused to genes encoding the coat protein of a bacteriophage. Bacteriophage containing such gene fusions are used to infect bacteria, and the resulting phage particles have coats that express the antibody-like fusion protein, with the antigen-binding domain displayed on the outside of the bacteriophage. We are used the human single fold scFv library I (Tomlinson I+J) which is based on a single human framework for VH and VK with side chain diversity and comprises over 100 million different scFv fragments cloned in an ampicillin resistant phagemid vector and transformed into TG1 E. Coli cells.

Results: Applied library contains at least twenty clones which can react with bacterial cell lysate of *F. tularensis* live vaccine strain. Further this library contains two clones react with recombinant protein FTT 1103 Δ signal of *F. tularensis* which was constructed without signal sequence.

Conclusion: Regarding our results, we sought to demonstrate that the phage display can be perspective used for development of monoclonal antibodies for both research and diagnostics, eventually for prophylaxis and therapeutics of tularemia infection.