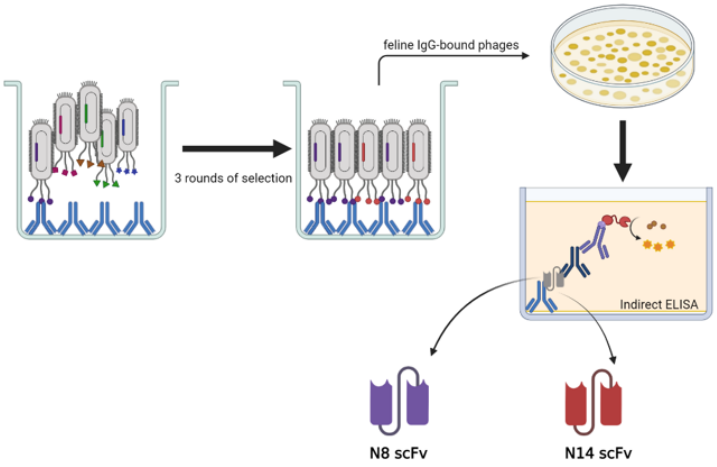
Selection of single-chain antibody variable fragment (scFv) against feline immunoglobulin G for biosensor applications

Natchaya Rasri [1], Montarop Yamabhai [2], Lueacha Tabtimmai[3] and Kiattawee Choowongkomon [1,*]

[1] Department of Biochemistry, Faculty of Science, Kasetsart University, 50 Ngam Wong Wan Road, Chatuchak, Bangkok 10900, Thailand; natchaya.rasr@ku.th
[2] Molecular Biotechnology Laboratory, School of Biotechnology, Institute of Agriculture Technology, Suranaree University of Technology, Nakhon Ratchasima 3000, Thailand; montarop.g@sut.ac.th
[3] Department of Biotechnology, Faculty of Applied Science, King Mongkut's University of Technology North Bangkok, Bangkok, 10800, Thailand; Lueacha.t@sci.kmutnb.ac.th
* Correspondence: kiattawee.c@ku.th; Tel.: +662-562-5444 Ext 2046

Abstract: Feline infectious disease is one of the most commonly health problems and leading to cause of death for over decades such as Toxoplasmosis, Feline leukemia virus (FeLV) disease, especially Feline immunodeficiency virus (FIV) disease. The early of diagnosis is essentials to increase the chance for successful of treatment. Measurement of IgG are generally considered of an individual's immune status for particular pathogen. In addition, the antibodies specific to feline IgG is an essential component for develop the detection kit. However, conventional monoclonal antibodies have been concerned in term of time-and cost-consuming production, animal requirement, and unstable under harsh conditions. Currently, recombinant antibody fragment technology becomes an effective strategy to rapidly produce binder molecules such as single-chain variable fragment (scFv) that are time-and cost-effective, batch consistency, and pilot scale production. Herein, this study aimed to select feline IgG-bound scFv by using phage display technology. Three rounds of biopanning was done against purified feline IgG. Out of the soluble 8 scFv clones were subjected to determine the binding ability against the target by indirect ELISA. N8 and N14 clones elicited the highest binding capacity against the purified feline IgG. The results from PCR and western blot analysis were done to reveal the expected molecular size in term of DNA (~1000 bp) and protein (~29 kDa). Taken together, this study successfully selected the feline IgG-bound scFv that could be further engineered, purification and development for FIV detection kit.

Graphical abstract:



Keywords: feline IgG; phage display; single-chain variable fragments (scFv)

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