NEUTRALIZATION CAPACITY OF PRE-MEMBRANE AND ENVELOPE ANTIBODY RESPONSE OF DENGUE SEROTYPE-1 DNA VACCINE AGAINST HOMOTYPIC AND HETEROTYPIC DENGUE VIRUSES

Angky Budianti[1], Dwi Hilda Putri[2], Beti Ernawati Dewi[1], Agus Sjahrurachman[1], Mulya Rahma Karyanti[3], T Mirawati Sudiro[1] and Fithriyah Sjatha[1]

[1]Microbiology Department, Faculty of Medicine, Universitas Indonesia-Cipto Mangunkusumo Hospital, Jakarta; [2]Department of Biology, Faculty of Mathematics and Sciences, Padang State University, Padang, West Sumatera;[3]Department of Child Health, Cipto Mangunkusumo Hospital, Jakarta, Indonesia

Abstract. Dengue virus (DENV) infection is still a burden in tropical countries such as Indonesia. Although approved dengue vaccine is now currently available, high viral dispersity and variety still remain challenges for vaccine efficacy. A DNA vaccine was developed based on pre-membrane and envelope (prME) gene of dengue serotype-1 (DENV-1) genotype-1 isolated from dengue patient during a dengue outbreak in Jakarta in 2009. PrME DENV-1 genes were inserted into pUMVC4, a mammalian expression vector, producing pUMVC RDS 59/09 recombinant DNA vaccine, followed by antigen expression by immunostaining. Individual mouse serum from immunized mice was tested for antibody response and pooled sera were analyzed using a focus reduction neutralization test (FRNT) to assess neutralizing antibody capacity against homotypic and heterotypic DENV-1 isolates. ELISA indicated induction of antibody levels and high $FRNT_{50}$ values of neutralizing antibodies were also obtained against homotypic DENV-1 genotype-1 and heterotypic genotype-4. The results show DENV DNA vaccine was promising approach, which merits further development as a dengue vaccine prototype.

Keywords: antibody, dengue, DNA vaccine, neutralization capacity

Correspondence: Fithriyah Sjatha, Microbiology Department, Faculty of Medicine, Universitas Indonesia-Cipto Mangunkusumo Hospital. Jl Pegangsaan Timur no. 16, Central Jakarta 10320, Indonesia.
E-mail: titi_sjatha@yahoo.com