

Evaluating DNA vaccine encoding GRA5 antigen of *Toxoplasma gondii* in BALB/c mice

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Background: Severe or lethal damages of toxoplasmosis clearly indicate the need for the development of a more effective vaccine. Immunization with recombinant plasmid encoding protective proteins is a promising vaccination technique. Therefore, this study aimed to evaluate the immunization with plasmid encoding GRA5 antigen of *Toxoplasma gondii* in BALB/c mice.

Materials and Methods: In this experimental study, three groups of BALB/c mice (n=10 in each group) were selected using simple random sampling. GRA5 gene was cloned into pcDNA3 plasmid and purified by plasmid purification kits and then the product was injected (IM). To determine the status of cellular and humoral immunity, the IL-4, IFN- γ and IgG, IgG2a, IgG subtypes were evaluated respectively using the ELISA-based assay.

Results: The group immunized with pcGRA5 indicated a significant augmented response in humoral and cellular immunity ($P \leq 0.05$) which was confirmed by MTT test. The mean survival time for the experimental and control groups were 9 and 6 days, respectively.

Conclusion: The immunized mice by pcGRA5 produce the higher titers of IFN γ indicated a Th1 response which is confirmed by the high level of IgG2a. Findings of this study demonstrate that GRA5 gene of *T. gondii* can be a potential vaccine candidate against the toxoplasmosis.

Keywords: *Toxoplasma gondii*, DNA vaccine, GRA5 antigen, humoral immunity, cellular immunity.

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