

## Inducing the immune responses by two novel *Plasmodium vivax* circumsporozoite based vaccine candidates formulated in a new adjuvant system in C57BL/6 mice

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**Statement of the Problem:** The majority of malaria vaccine studies have mainly focused on *Plasmodium falciparum*, but *Plasmodium vivax* have been ignored. However, *P. vivax* is able to develop hypnozoites, which increases the morbidity caused by a single infection and severe malaria. Additionally, a vaccine targeting of *P. vivax* represents a necessary tool when considering the elimination/eradication goal. Many efforts have been conducted to design a vaccine based on circumsporozoite protein (CSP). Because of limited immunogenicity and less effectiveness of protein-based vaccines, these types of vaccines require adjuvant to induce a protective and long-lasting immune response. In this investigation, we evaluate the immunological potency of two newly designed PvCSP based vaccines in combination with a novel adjuvant system (AS).

**Methodology & Theoretical Orientation:** Both CS127 and CS712 constructs include N- and C-terminal parts and a truncated region containing repeat sequences with different arrangement from both PvCSVK210 and PvCSVK247 subtypes. After expression, purification, desalt and concentration, constructs were formulated with novel AS (NLX, CpG and QS21). 6-8 weeks female C57BL/6 mice were immunized with 3 boosts with 2 week interval. Humoral responses include specific antibodies and subclasses against PvCSP, titration and avidity of antibodies, and cellular responses includes lymphocyte proliferation assay and cytokine profiles were evaluated with ELISA, MTT and cytokine assay, respectively.

**Findings:** Our results show that both constructs are highly immunogenic in C57BL/6 mice. Both candidates in combination with AS induce high levels of antibody against PvCSP with high titration and avidity of Th1 related antibodies. Analysis of the induced T-cells highlighted different cytokine profile with significant secretion of IFN- $\gamma$  and TH1 responses.

**Conclusion & Significance:** Further clinical investigation is needed of these two candidates in primate models to reach the added value in both immunogenicity and protective efficacy.

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## Prevalence and pathology of *Acanthocephalus ranae* infestation in finfishes of Tamil Nadu, southeast coast of India

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The seasonal variations and pathological studies of the Acanthocephala infestation were investigated from southeast coast of India. The adult worms' proboscis is cylindrical, the length and width ranging between 1.2-7.3 cm and 1.0-1.8 mm respectively. *Caranx ignobilis* was the major host in terms of prevalence and intensity among the other finfish species examined for infestation and seasonal variation of *Acanthocephalus ranae* over three year period. Grossly, the parasites attached tissues were wounded, reddish, swollen, abraded and thickened. Histologically, the infested intestinal outer wall of the muscularis externa and tip of the proboscis is still inverted; hyperplasia of the intestinal villi and lamina propria near the site of parasitic attachment were also evidenced. Cellular infiltrated area surrounding the proboscis, aggregation of lymphocytes and fibroblasts at the site of inflammation were observed from the parasitized intestine. Long live parasite increases the cellular infiltration and it may leads to the tumorous conditions of the infested hosts.

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