

[0090] Sporozoite motility is an indirect measure of the viability and health of the parasites, therefore the motility assay can serve as a functional readout to determine whether the presence of anti-CeLTOS antibodies can inhibit the motility of sporozoites in a gliding motility assay. To this end, mature sporozoites (day 18-20) from salivary glands were dissected and incubated for 15 min with either control serum or various other antisera. After the pre-incubation, the sporozoites were plated without washing onto glass slides and incubated for 1 hr at 37° C. The incubation of sporozoites with control mouse serum (either pre-immune or serum from adjuvant-injected mice) resulted in the deposition of CSP; CSP trails were typically extensive and allowed the ability to establish an overall fitness of the sporozoites (see FIG. 15A). Similarly, the presence of CSP-specific mAbs resulted in extensive trails that often were more pronounced and stronger than for control cultures (see FIG. 15B). In contrast, the presence of anti-PfCeLTOS specific antisera led to either much shorter trails or no trails at all (see FIG. 15C).

[0091] This experiment how a humoral anti-CeLTOS response can confer protection in a live host.

[0092] While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.

REFERENCES

- [0093]** (The contents of each of which, and the contents of every other publication, including patent publications such as PCT International Patent Publications, being incorporated herein by this reference.)
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1. A synthetic nucleotide, which transcribes as an antigen of Malaria *Plasmodium* and comprises of nucleotide sequence SEQ ID NO:1 or a substantially homologous sequence thereof.
 2. A synthetic nucleotide, which transcribes as an antigen of Malaria *Plasmodium* and comprises of nucleotide sequence SEQ ID NO:4 as modified for codon harmonization or a substantially homologous sequence thereof.
 3. A synthetic polypeptide, which acts as an antigen of Malaria *Plasmodium* and comprises of amino acid sequence SEQ ID NO:2 or a substantially homologous sequence thereof.
 4. A synthetic polypeptide translated from a codon harmonized, wild-type nucleotide sequence that transcribes as Malaria *Plasmodium* CeLTOS protein.
 5. A malaria vaccine, which comprises, as an active component, the synthetic nucleotide of claim 1.
 6. A malaria vaccine, which comprises, as an active component, the synthetic polypeptide of claim 3.
 7. A diagnostic agent for malaria, which comprises, as an active component, the synthetic nucleotide of claim 1.
 8. A diagnostic agent for malaria, which comprises, as an active component, the synthetic polypeptide of claim 3.
 9. A process for purifying the synthetic polypeptide of encoded by the synthetic polynucleotide of claim 1, which comprises collecting the cells from a culture solution of *Escherichia coli* transformed with the synthetic nucleotide of claim 1 and carrying out each step in order of cell destruction, fractionation by salting-out, membrane filtration, column chromatography, and dialysis.
 10. A method of using the malaria vaccine of claim 5, comprising using said vaccine in combination with other treatments for malaria.
 11. A method of using the malaria vaccine of claim 6, comprising using said vaccine in combination with other treatments for malaria.
 12. A reagent for stimulating the human immunologic response comprising the synthetic nucleotide of claim 1.
 13. A reagent for developing monoclonal antibodies against a *Plasmodium* parasite comprising the synthetic nucleotide of claim 1.
 14. A reagent for studying protein folding and structure comprising the synthetic nucleotide of claim 1.
 15. The synthetic polypeptide of claim 3, wherein said protein is recombinantly expressed with no post-translational N-glycosylation.
 16. A malaria vaccine, which comprises, as an active component, the synthetic nucleotide of claim 2.
 17. A malaria vaccine, which comprises, as an active component, the synthetic polypeptide of claim 4.
 18. A diagnostic agent for malaria, which comprises, as an active component, the synthetic nucleotide of claim 2.
 19. A diagnostic agent for malaria, which comprises, as an active component, the synthetic nucleotide of claim 4.
 20. A process for purifying the synthetic polypeptide of encoded by the synthetic polynucleotide of claim 2, which comprises collecting the cells from a culture solution of