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## Development of an experimental vaccine against *Plasmodium yoelii* infection based on MAEBL-M2 domain in DNA (Prime)–Protein (Boost) immunization regimen

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Malaria causes 300–500 million new infections and 1-2 million deaths annually, and immunoprotection achieved by the most successful vaccine is still partial and short lived. MAEBL is a chimeric molecule expressed in infected erythrocytes and possesses amino terminal cysteine-rich, a transmembrane and a cytoplasmic domain. This molecule also contains two other domains (M1 and M2) involved in parasite attachment to red blood cells, and is also expressed in salivary glands sporozoites and in infected hepatocytes. Here, we amplified, cloned and expressed *Plasmodium yoelii* MAEBL-M2 domain, in eukaryotic (pcDNA3) and prokaryotic (pet28a) vectors, to be used for injection as a recombinant protein (rM2-MAEBL) and as a naked DNA (M2pcDNA3) in DNA (Prime)–Protein (Boost) immunization regimen. Mice immunized with four doses of rM2-MAEBL in Freund adjuvant (CFA/IFA) or primed with M2pcDNA3 followed by three doses of rM2-MAEBL displayed high levels of antibodies against the recombinant protein. After challenge with *P. yoelii* lethal strain, a significant reduction on parasitemia levels and protection of 90% or 100% were observed, respectively in the group immunized with the recombinant protein or with DNA (Prime)–Protein (Boost) in comparison to CFA/IFA injected animals. Moreover, in immunofluorescence assays antisera harvested from mice immunized with rM2-MAEBL or DNA (Prime)–Protein (Boost) recognized native protein on free *P. yoelii* or *P. falciparum* merozoites, and inhibited up to 51% *P. falciparum* (3D7) merozoite reinvasion in comparison to CFA/IFA group. Collectively, these data confirm the potential use of this antigen as a vaccine candidate against malaria blood forms, and open perspectives for the development of an experimental vaccine targeting erythrocytic and pre-erythrocytic stages of the parasite.

### Biography

Fabio T. M. Costa has completed his Ph.D. at the age of 29 years from Federal University of São Paulo and postdoctoral studies from Institut Pasteur/ Université de la Méditerranée. He is tenured professor and principal investigator at University of Campinas. He has deposited three patents, published more than 30 papers in peer-reviewed journals and serving as an editorial board member of PLoS ONE journal.