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Malaria vaccine development: The Plasmodium falciparum serine repeat antigen

Toshihiro Horii

Research Institute for Microbial Diseases, Osaka University, Japan

One of the most important parasitic diseases, malaria, caused by Plasmodium falciparum, has persisted and flourished despite global efforts to address the disease. Undoubtedly, vaccination is a key tool for malaria control and eradication. The development of an effective vaccine, however, remains elusive. Serine repeat antigen 5 (SERA5), is a member of a multigene family in *Plasmodium*. SERA5 was demonstrated to be essential for parasite survival and is believed to mediate parasite egress from the infected erythrocyte. Being an abundant, exported late-trophozoite and schizont-stage protein of *P. falciparum*, SERA5 induced antibodies that either offered protection against blood stage infection in vivo or inhibited parasite growth in vitro. Inhibition of proteolytic processing results in a block of parasite release from the host. Epidemiological studies show good correlation of anti-SERA antibodies to malaria protection against severe disease or fever and parasitemia. In its path towards clinical development a codon optimized recombinant protein, SE36, was obtained in large amounts suitable under Good Laboratory Practice (GLP) and has undergone preclinical studies for safety and immunogenicity. In 2005, a randomized, single-blind, placebo-controlled Phase-1a clinical trial of SE36 was undertaken in healthy Japanese adult volunteers. Three subcutaneous administrations of two doses were not different in terms of safety, although those administered with 100µg-SE36 attained their plateau antibody titers before third administration. Age de-escalation Phase-1b trial was done in a malaria endemic area of Northern Uganda during April 2010-Feb 2011. Here, recent advancement in the development of P. *falciparum* malaria vaccine candidate serine repeat antigen will be presented.

Biography

Prof. Toshihiro Horii is the Director of the Research Center for Infectious Disease Control and International Research Center for Infectious Diseases, Research Institute for Microbial Diseases (RIMD) of Osaka University. Also, a Professor of the Department of Molecular Protozoology, his group has undertaken novel studies on several aspects of *P. falciparum* biology including the vaccine candidate, serine repeat antigen SE-36. Work with SE-36 is a collaborative effort of RIMD (Nirianne Marie Palacpac, Ken J. Ishii), BIKEN (Hiroki Shirai, Nahoko Suzuki, Takuya Okada, Tetsutani Kohhei, Shigeharu Ueda), and MBL (Adoke Yeka, Edward Ntege, Thomas Egwang for the BK-SE36 Uganda Trial Team).