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Pusat Pengajian Sains Kesihatan

SKIM-XI
Simposium Kebudayaan Indonesia – Malaysia

UNIVERSITAS PADJADJARAN

UNIVERSITI KEBANGSAAN MALAYSIA

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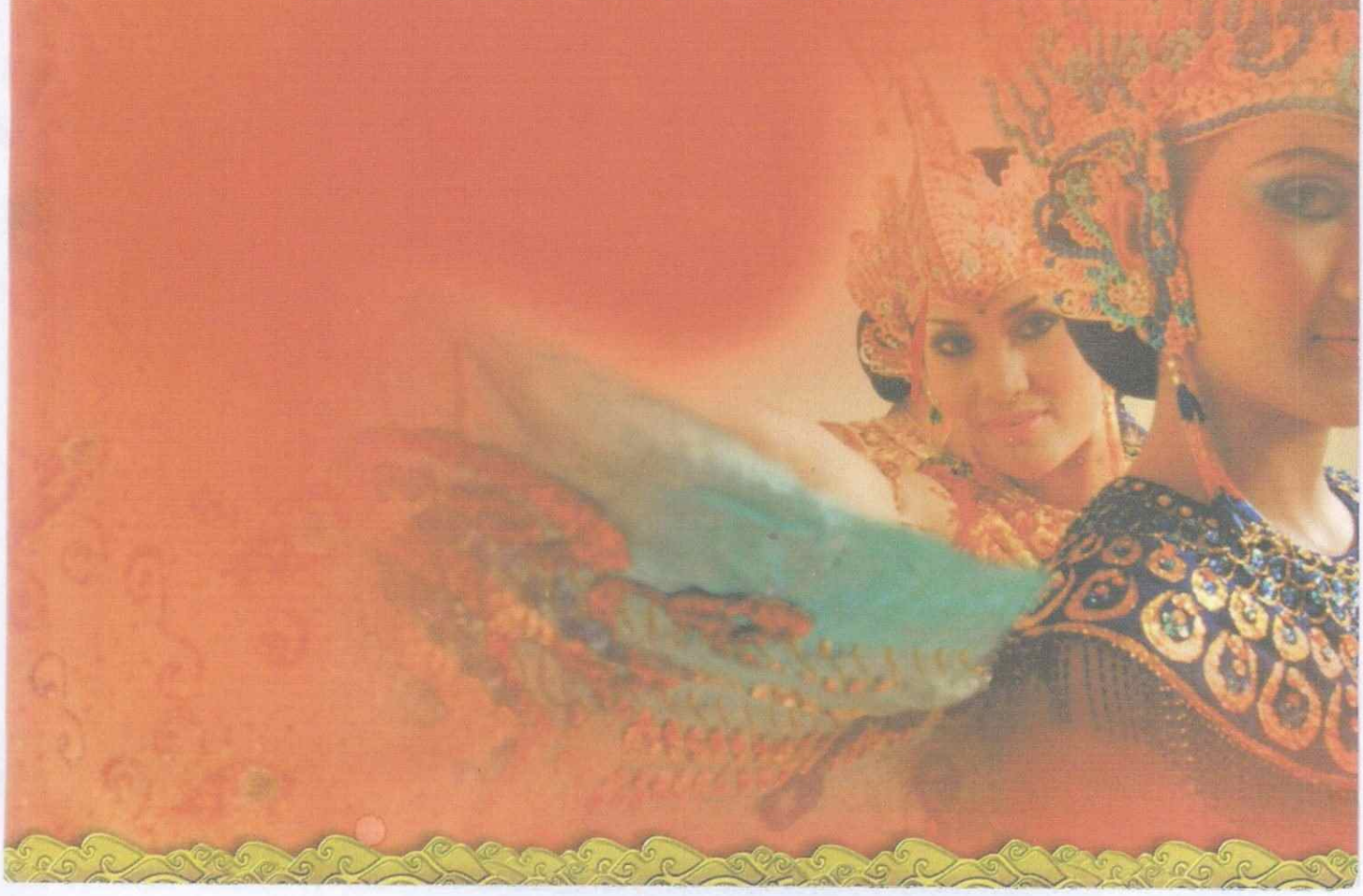
Kampus Iwa Koesoemasoemantri, Universitas Padjadajaran
Jln. Dipatiukur No. 35, Bandung 40132 Indonesia

Tema Utama

Pembangunan untuk Kesejahteraan dan Perdamaian: Pengalaman Indonesia dan Malaysia

Panduan Acara & Abstrak



8.17. POTENTIAL VACCINES AGAINST MALARIA

Oleh :
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ABSTRAK

Malaria is one of the most devastating infectious diseases affecting much of the underdeveloped world with approximately 300–500 million people displaying clinical manifestations each year. *Plasmodium falciparum* is responsible for more then 90% of malaria cases in Africa and accounts for more than one million deaths annually. Due to the emergence of insecticide-resistant mosquito vectors and chloroquine-resistant parasites in many parts of the world as well as the complexity of the parasite life cycle, the development of a safe and effective malaria vaccine is urgently need to fight against malaria. DNA vaccines have already been applied to deliver foreign antigens to the immune system in a wide range of infectious diseases including malaria. In this study, a DNA vaccine expressing the synthetic epitope of *Plasmodium falciparum* F2R(II)EBA has been constructed. Immunogenicity study in Balb/c mice showed that the candidate vaccine is able to induce humoral immune response against the epitope. This study demonstrated the potential of using DNA vaccine to protect against malaria infections in humans in the near future.

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Kumpulan Makalah

POTENTIAL VACCINES AGAINST MALARIA

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ABSTRACT

Malaria is one of the most devastating infectious diseases affecting much of the developing and underdeveloped world with approximately 300–500 million people displaying clinical manifestations each year. Plasmodium falciparum is responsible for more then 90% of malaria cases in Africa and accounts for more than one million deaths annually. The emergence of insecticide-resistant mosquito vectors and chloroquine-resistant parasites in many parts of the world as well as the complexity of the parasite life cycle emphasize the importance of a safe and effective vaccine to fight against malaria. DNA vaccines and recombinant vaccines have already been applied to deliver foreign antigens to the immune system in a wide range of infectious diseases including malaria. In this study, a DNA vaccine and a recombinant BCG (rBCG) vaccine expressing the synthetic epitope of Plasmodium falciparum, F2R(II)EBA have been constructed. Immunogenicity study in Balb/c mice showed that the candidate vaccines are capable to induce humoral immune response against the epitope. This study demonstrated the potential of using DNA vaccine and rBCG vaccine to protect against malaria infections in humans in the near future.

Key words: DNA vaccine, Malaria, recombinant BCG

INTRODUCTION

Malaria, a parasitic infection transmitted through the bite of the Anopheles mosquito is one of the major causes of death and an important barrier to economic progress in countries where the disease is endemic. In some highly endemic countries, almost 40% of public health expenditures are devoted to malaria prevention and control (1). World Health Organization (WHO) estimated that approximately 1 to 3 million people die as a result of this infection (2). Four species of plasmodium are responsible for human malaria; *Plasmodium falciparum, P. vivax, P. malariae* and *P. ovale*. Among these, *P. falciparum* is the most virulent and accounts for the majority of instances of morbidity and mortality.

Currently, malaria can be controlled by using insecticides, bednets and treatment with various anti-malarial drugs such as chloroquine. With the spread of insecticide-resistant mosquito vectors and increasing prevalence of resistant parasites as well as the fact that malaria infections does not induce immune protection towards future exposure, there is an urgent need to develop an effective vaccine to control malaria.

Malaria parasites have a complex life cycle involving mosquito and human (Figure 1). Two developmental stages occur in human; the pre-erythrocytic stage in the liver involving the sporozoite and hypnozoite, and the erythrocytic or blood-stage in the blood, involving the merozoite. Of these, the erythrocytic or blood-stage of the parasite's life cycle is the most important for the development of vaccine against malaria since at this stage, the parasites invade erythrocytes which in turn produces the clinical symptoms of malaria such as fever, chills, headache, lassitude, muscle aches and in severe cases, unconsciousness and eventual death. Humoral or antibody