

## MVI-WEHI Collaboration Aims to Explore AMA1 Vaccine Components

### THE PROJECT Exploring the Possibilities of the AMA1 Protein

The PATH Malaria Vaccine Initiative (MVI) is collaborating with the Walter and Eliza Hall Institute of Medical Research (WEHI) to explore which variations of the AMA1 protein—the most advanced blood-stage vaccine candidate component—have the potential to be included in a vaccine that targets different strains of *Plasmodium falciparum* malaria. WEHI also will explore the development of tools to measure AMA1-specific antibodies for future application to vaccine trials.

### THE POTENTIAL Advancing Vaccine Candidates into Clinical Trials

**Malaria is a devastating disease** that takes the lives of close to one million people every year. Pregnant women and children under five are at particularly severe risk. Malaria also causes illness and hospitalization among tens of millions of others in the developing world. Transmitted by the bite of the female *Anopheles* mosquito, this parasitic infection further drains the economies of already desperately poor countries, many of whose citizens exist on less than \$2 per day. A vaccine is urgently needed to help end the cycle of poverty made worse by malaria and to reduce the burden of disease and death caused by this preventable disease.

### AMA1 Research

**A vaccine can target several points during the life cycle** of the malaria parasite. Vaccines targeting the blood stage (merozoite) would prevent the parasite from entering human red blood cells. Apical membrane antigen 1 (AMA1), a protein found at the apex of the blood stage of the malaria parasite, is the most advanced blood-stage candidate. A vaccine that stimulates the production of AMA1 antibodies would limit the ability of the merozoites to infect and destroy red blood cells.

Antigenic polymorphism is an important mechanism by which malaria parasites evade host immune responses. Vaccine strategies involving a single target antigen may have their effectiveness limited by antigenic polymorphisms, which allow divergent parasites to elude a vaccine's protective properties. AMA1 is a polymorphic antigen and there is concern that vaccines containing one or two strains of AMA1 may not provide protection against the wide range of *P. falciparum* genotypes to be useful for controlling malaria. Pursuing a strategy involving multiple allelic variants of a single antigen is one way to overcome this mechanism of immune evasion.

Under this collaborative agreement, WEHI and MVI will explore AMA1 variants that have

the potential for inclusion in a multivalent vaccine that would provide broad protection against different strains of the disease. WEHI will also conduct further research aimed at tackling AMA1's polymorphism issue with respect to optimizing the protein as a vaccine component. In addition, WEHI will explore the development of functional assays to measure AMA1-specific antibodies for future application to vaccine trials and clinical studies.

**THE PATH MALARIA VACCINE INITIATIVE (MVI)** is a global program established at PATH through an initial grant of \$50 million from the Bill & Melinda Gates Foundation. MVI's mission is to accelerate the development of malaria vaccines and ensure their availability and accessibility in the developing world. MVI's vision is a world free from malaria. For more information, please visit [www.malariavaccine.org](http://www.malariavaccine.org).

**PATH** is an international, nonprofit organization that creates sustainable, culturally relevant solutions that enable communities worldwide to break longstanding cycles of poor health. By collaborating with diverse public- and private-sector partners, PATH helps provide appropriate health technologies and vital strategies that change the way people think and act. PATH's work improves global health and well-being. For more information, please visit [www.path.org](http://www.path.org).

**THE WALTER AND ELIZA HALL INSTITUTE OF MEDICAL RESEARCH (WEHI)** was founded in 1915 and was Australia's first medical research institute. In the early 21st century, WEHI is the nation's largest institute of its kind, with a scientific and support staff of over 600 people. It is one of the world's leading medical research centres, with work covering cancer, genetics, malaria, immunity, medicinal chemistry, drug candidate discovery and autoimmune diseases such as diabetes, celiac disease and rheumatoid arthritis. For more information, please visit [www.wehi.edu.au](http://www.wehi.edu.au).