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International Malaria Vaccines for the World Conference to showcase scientific push for “next generation” products

***PATH Malaria Vaccine Initiative (MVI) and partners to report on new research and
innovations in pursuit of eradicating prolific killer***

WASHINGTON, DC (September 28, 2010) — Malaria experts from around the world are gathering in Washington this week to discuss cutting edge research into a new generation of malaria vaccines that includes efforts to construct a genetically engineered “DNA vaccine,” to uncover new vaccine targets that appear early in malaria infections, and to develop immunizations that could block malaria transmission between mosquitoes and humans.

The reports from the frontlines of malaria vaccine research will be delivered at the Second International Malaria Vaccines for the World Conference, to be held September 28–30 in Washington, DC, which will feature an extensive discussion of the portfolio of projects supported by the PATH Malaria Vaccine Initiative (MVI). MVI is committed to developing vaccines that can help eradicate a disease that kills nearly 900,000 people each year, most of them children in sub-Saharan Africa.

“We are eager to build on the progress we have made in the last 10 years and are challenging the malaria vaccine community and others to produce innovations that will enable us to eliminate this disease once and for all,” said Dr. Christian Loucq, director of MVI.

MVI is currently partnering with GlaxoSmithKline (GSK) Biologicals and research centers across Africa to conduct Phase 3 testing of GSK’s RTS,S malaria vaccine, the world’s most clinically advanced malaria vaccine candidate. If successful in Phase 3 testing and licensure, RTS,S could satisfy the intermediate goal set forth in the international community’s Malaria Vaccine Technology Roadmap of a “first-generation” malaria vaccine that is at least 50 percent effective against severe disease and death and lasts more than one year.

Diversity of new approaches

Much of the research to be presented at the MVI portfolio session at the World Conference is focused on identifying and developing new malaria vaccine targets and approaches. MVI is already laying the foundation for a next-generation vaccine that is at least 80 percent effective against clinical disease and lasts longer than four years. Even more ambitiously, MVI is supporting the development of vaccine approaches that fight malaria by interrupting its transmission from mosquitoes to humans.

Blocking transmission of malaria to others

Rhoel Dinglasan of the Johns Hopkins Bloomberg School of Public Health (JHSPH) will offer an update, including preclinical results, on the partnership involving JHSPH, MVI, and the Sabin Vaccine Institute to develop a transmission-blocking vaccine. The project is focused on an antigen found in malarial mosquitoes called AnAPN1, which appears to play a major role in malaria parasite establishment within the mosquito.

Preliminary field research has shown that antibodies induced by this antigen are capable of blocking transmission of the two deadliest malaria parasites, *Plasmodium falciparum* and *P. vivax*. When a mosquito takes blood from a person vaccinated with these antibodies, disease transmission would be interrupted by preventing the parasite from attaching to and invading the mosquito's gut. Interrupting this critical step in the life cycle of the parasite would serve to reduce the number of infected mosquitoes in endemic areas, thereby reducing subsequent rates of transmission to humans. Such a vaccine approach is viewed as being a critical tool to support efforts to eliminate malaria in the future.

Expanding the malaria vaccine antigen library

Patrick Duffy, an investigator with the National Institute of Allergy and Infectious Diseases (NIAID) who also heads the malaria program at Seattle BioMed, will provide an update on new efforts to identify promising targets for a malaria vaccine, focusing on the pre-erythrocytic stage, before the parasite reaches the bloodstream.

“We are moving quickly to provide vaccine developers with specific antigens that could improve the effectiveness of immunizations by forcefully engaging the disease soon after the parasite enters into the body,” Duffy said.

Using novel delivery platforms to prime and boost the immune response

MVI is exploring a number of approaches that would build on the success to date of RTS,S by first priming the immune system to respond to the malaria parasite, and then boosting that response. One such approach is being developed in collaboration with the US Agency for International Development (USAID) and the Dutch biopharmaceutical company Crucell N.V. This approach uses adenoviruses (a type of virus associated with the common cold and other minor respiratory infections) to deliver a malaria antigen to the immune system. The so-called “prime-boost” approach will be the subject of a symposium, also sponsored by MVI, to be held later this year at the annual conference of the American Society of Tropical Medicine and Hygiene in Atlanta.

One potential delivery platform that will be discussed this week, is a project led by David Weiner of the University of Pennsylvania, Philadelphia, one of the world's leading authorities on what are known as DNA vaccines, and Inovio Pharmaceuticals (Blue Bell, PA). Weiner will present preclinical data on their efforts to use Inovio's enhanced electroporation delivery-DNA vaccine approach to create a malaria vaccine that targets multiple immune targets of the parasite in the early stages of human infection.

The DNA vaccine platform utilizes a simple circular string of bacterial DNA, also known as plasmid DNA, that has been genetically engineered to produce disease-related proteins. DNA vaccines are similar to conventional vaccines in that the goal is to convince the body to recognize and attack the targeted disease as a foreign invader. An increasing body of preclinical and clinical data suggests that DNA vaccines have the potential to produce a particularly strong immune response that could be directed at multiple target antigens. DNA vaccines also could be less expensive and easier to store and transport than conventional vaccines due the relative simplicity of manufacture and appealing stability attributes.

“The idea of using genetically engineered DNA to make a malaria vaccine has been around for several years; however, recent advances in the development of more effective delivery approaches—formerly the Achilles heel of this technology—using electroporation are creating exciting new opportunities,” Weiner

said. “We believe it is particularly exciting to explore applying this innovative approach to battling the malaria parasite, which biologically is such a formidable opponent.”

Cutting off parasite invasion pathways to blood

In another presentation, Julie Healer of the Walter and Eliza Hall Institute of Medical Research in Melbourne, Australia, will discuss progress toward developing a vaccine that seeks to inhibit growth of the malaria parasite by targeting multiple “invasion pathways” simultaneously. This vaccine approach builds on cutting-edge malaria research that has unraveled a complex network of invasion strategies used by the most deadly malaria parasites to invade red blood cells, the precursor to the emergence of malaria disease symptoms.

Targeting the second deadliest type of malaria

These presentations offer just a sampling of the broader portfolio currently being supported by MVI. For example, MVI recently moved to accelerate the development of a vaccine against the second most serious malaria parasite, *P. vivax*, through a partnership with the Walter Reed Army Institute of Research (WRAIR), the US Army Medical Materiel Development Activity (USAMMDA), and GSK. Though not as deadly as *P. falciparum*, 40 percent of the world’s population lives at risk of malaria caused by *P. vivax*.

The MVI-supported collaboration is focused on preliminary evaluation of the safety and efficacy of a *P. vivax* vaccine approach in which an antigen known as VMP001 has been formulated with GSK’s Adjuvant System AS01—the same adjuvant used with RTS,S.

Ashley Birkett, MVI’s director of pre- and early-clinical research and development, said the Malaria Vaccines for the World Conference offers an opportunity for scientists to learn more about creative concepts now being explored in the field of malaria vaccine research, particularly as MVI seeks to broaden its partnerships inside and outside the malaria research community.

“We invite scientists to bring us their ideas and innovations,” Birkett said. “We are open to evaluating a range of potential approaches and technologies, even if they are at an early stage of development.”

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About the PATH Malaria Vaccine Initiative (MVI) The PATH Malaria Vaccine Initiative (MVI) is a global program established at PATH in 1999 through an initial grant 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.

About PATH PATH is an international nonprofit organization that creates sustainable, culturally relevant solutions, enabling 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.