First steps taken toward the development of a malaria transmission-blocking vaccine

January 15 2010

The PATH Malaria Vaccine Initiative (MVI) today announced a new collaboration to initiate development toward a vaccine that may eventually help eliminate and eradicate malaria. This collaboration with the Johns Hopkins Bloomberg School of Public Health (JHSPH) and the Sabin Vaccine Institute (Sabin) marks MVI's first investment in transmission-blocking vaccines (TBVs). This vaccine approach aims to stop the malaria parasite from developing in the mosquito, effectively blocking transmission of malaria from mosquitoes to humans. Malaria kills nearly 900,000 people per year, most of them children younger than age five.

"The heart-breaking devastation caused by malaria cannot be overstated," according to Dr. Peter Agre, Nobel Laureate and Director of the Johns Hopkins Malaria Research Institute (JHMRI). "Blocking transmission by novel vaccines may provide the approach needed to stop the epidemic. MVI deserves great credit for supporting potentially exciting research that would otherwise be abandoned due to lack of precedent."

"Although eradication is a very long-term and aspirational goal, we are excited by the potential of transmission-blocking vaccines to significantly limit the spread of malaria infection," noted Dr. Christian Loucq, Director of MVI. "In combination with other interventions, we believe a successful TBV would provide another important tool in the fight against malaria."

Over the next 18 months, MVI's partners will collaborate to produce and characterize an antigen that can activate the body's defenses to disrupt the complex human-mosquito transmission cycle of malaria. An antigen is any substance that triggers the immune system to produce antibodies against it.

The development team will identify the optimal conditions needed to manufacture clinical supplies of AnAPN1, a mosquito antigen that appears to play a major role in 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 vaccinated person, these antibodies prevent the parasite from attaching to and invading the mosquito's gut.

"The antibodies that we have produced are effective against multiple malaria parasites and, therefore, this antigen may constitute the basis for a future 'universal' or pan-malaria transmission-blocking vaccine." said Dr. Rhoel Dinglasan, lead researcher on this project and faculty member at JHSPH. "This could have a tremendous impact on malaria transmission, even extending beyond those individuals we can reach through a vaccination campaign."

"We look forward to supporting MVI's innovative efforts in the development of transmission-blocking vaccines for malaria," said Dr. Ami Shah Brown, Director of Vaccine Operations for the Sabin Vaccine Institute. "Together with our partners at The George Washington University, we are very excited to utilize our existing vaccine development capabilities and work with MVI and JHSPH to develop the AnAPN1 antigen."

This collaboration—MVI's first project focused on TBVs—reflects MVI's redesigned research and development strategy. The new strategy

encompasses a broader outlook on malaria vaccine development and promotes early investment in a variety of approaches that have the potential to reach the malaria community's long-term goal of a vaccine that is at least 80 percent effective against clinical disease for more than four years by 2025. Further, MVI is increasing support for vaccines targeting clinical disease caused by P.vivax, as well as vaccines that could interrupt the cycle of transmission of malaria parasites; two aspects of malaria vaccine development that have historically been poorly funded. These efforts are spurred by a renewed long-term commitment within the malaria community to eradicate the disease.

Source: PATH Malaria Vaccine Initiative