Researchers use E.coli to make potential malaria vaccine

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A Tulane University researcher has found a way to use E.coli bacteria to cheaply manufacture a once hard-to-produce protein critical to the development of a potential transmission-blocking malaria vaccine.

Nirbhay Kumar, professor and chair of tropical medicine at Tulane University School of Public Health and Tropical Medicine, worked with Evelina Angov of the Walter Reed Army Institute for Research to use the common bacteria to create a new process to purify and refold protein CHrPfs25. When tested as a vaccine, the protein produced a 100 percent effective malaria transmission-blocking antibody response in mice using the two most common species of malaria-carrying mosquitoes, according to results to be published in the April issue of the journal Infection and Immunity.

Malaria, which kills nearly 800,000 people every year worldwide, is caused by a microscopic parasite that alternates between human and mosquito hosts at various stages of its lifecycle. Kumar"s vaccine seeks to trigger an immune response in people so they produce antibodies that target a protein the malaria parasite needs to reproduce within a mosquito.

“This is the central step,” Kumar said. “Malaria affects the poorest of the poor. And if you are trying to make a vaccine for those billions of people who are at risk, you need to make it cheaper to manufacture. We think that producing this protein in bacteria will make it very cost effective for large-scale vaccine production.”

The next step will be to develop a version of the vaccine that can be used in clinical trials, Kumar said.

Transmission blocking vaccines, though not yet widely tested in humans, have the potential to be used in conjunction with more traditional malaria vaccines and other

interventionsâ??such as malaria drugs and bed netsâ??to fight the complex tropical disease and ultimately aid in the gradual elimination of the parasites.

Kumar"s studies are funded by the National Institutes of Health.