

New malaria test could lead to global eradication of the disease

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Credit: CDC

One of the biggest difficulties faced by worldwide programs aimed at eliminating malaria is that the tests they use are not sensitive enough to detect all people who have the disease and need treatment. A study appearing online today in *Clinical Chemistry*, the journal of AACC, shows that a new test known as capture and ligation probe-PCR (CLIP-PCR) could diagnose the malaria cases that would typically escape

detection and lead to new infections.

Malaria control programs have achieved remarkable success in the past decade, with 111 countries completely eliminating [malaria](#), and 34 more advancing toward [malaria elimination](#). The disease still remains a serious [public health threat](#) in many areas, though, such as in Africa, where the World Health Organization reports that a child dies every minute from this disease. To eliminate malaria across the world and prevent its resurgence, surveillance systems must be able to stop transmission of the parasite by detecting all possible malaria patients in an area and treating these patients in a timely manner. However, the diagnostic tests currently in use are not sensitive enough to detect asymptomatic, submicroscopic infections, which result in 20–50% of all malaria transmission episodes—and the technology that is sensitive enough to detect these cases is too expensive and difficult to implement in the developing world.

CLIP-PCR is highly sensitive, and can detect malaria concentrations as low as 0.01 parasitized cells/ μL of blood, versus current methods, which cannot detect concentrations below 40–50 parasitized cells/ μL . In a screening of 3,358 blood samples, CLIP-PCR identified 14 infections, including 4 asymptomatic ones, all of which were then confirmed by a second testing method.

Developed by a team of researchers led by Zhi Zheng, PhD, of the Chinese Academy of Medical Sciences, Beijing, CLIP-PCR is also more efficient and less costly than other highly sensitive malaria tests because it can be used on pooled blood samples. By pooling samples, the researchers were able to analyze the 3,358 study participants with fewer than 500 tests, and each test cost only \$0.60 per sample—a fraction of what a test would cost without pooling. This is a crucial advantage of CLIP-PCR, because in areas where parasite prevalence approaches elimination, a greater number of tests have to be performed to find one

positive infection.

"For most programs, increased massive screenings have placed additional demands on human and financial resources, stretching a surveillance system already strained by high workload and limited funding," said Zheng. "With drastically improved throughput, sensitivity, and affordability compared with current screening technology, CLIP-PCR can lead to a higher frequency of active surveys, a larger radius and coverage per survey, and a better detection rate for asymptomatic infections, all without substantial additional expenditures of human and financial resources in current malaria budgets."

More information: "Capture and Ligation Probe-PCR (CLIP-PCR) for Molecular Screening, with Application to Active Malaria Surveillance for Elimination": [www.clinchem.org/content/early ... 237115.full.pdf+html](http://www.clinchem.org/content/early/2015/05/12/237115.full.pdf+html)

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