Saliva as a proven, non-invasive sample type for molecular malaria testing and surveillance using OMNIgene®-DISCOVER at ambient temperature

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2014-09-19

Background
Saliva collection is a non-invasive alternative from RDTs for malaria detection and as a surveillance tool. Both P. falciparum and P. vivax DNA have been detected in saliva samples of malaria patients. It has been demonstrated that 1 mL of whole saliva samples harbours detectable levels of Plasmodium spp. DNA for downstream sequencing of pfdhfr and 18S rRNA. Therefore, saliva can be sampled for high sensitivity and specificity molecular-based malaria diagnosis. Additionally, participant compliance is increased with pain-free and easy saliva collection; therefore, providing greater access to Plasmodium DNA for improved monitoring of malaria transmission, identification of sub-patient or mixed Plasmodium species infections, and patient screening in artemisinin-resistance-emerging regions/elimination settings.

OMNIgene®-DISCOVER for sample stability and testing scalability
OMNIgene-DISCOVER enables non-invasive and pain-free collection of Plasmodium spp. DNA via saliva. The OMNIgene-DISCOVER chemistry stabilizes Plasmodium DNA in 1 mL of saliva at ambient temperature for up to 1 year, eliminating the cost and complexity of cold storage making it ideal for field collection in remote and low-resource settings. The easy-to-use and reliable nature of the OMNIgene-DISCOVER kits improves patient compliance in both adults and children.

The following data is from ongoing pilot studies that show promising indications for the use of OMNIgene-DISCOVER as a non-invasive alternative for malaria diagnostics.

P. falciparum DNA from 1 mL of saliva is a reliable sample type for malaria detection (n=100)
(Courtesy of Dr. Collins Ouma,Maseno University, Kenya, as presented at the 6th MIM Pan-African Malaria Conference in Durban, South African).

OMNIgene®-DISCOVER can be used as an alternative for non-invasive sample for the diagnosis of malaria in a PCR based reaction. This pilot study also proves that the OMNIgene-DISCOVER kit is very effective in preserving malaria DNA at room temperature.

Additional testimony
“We have successfully extracted P. falciparum from the OM-501 kits. Parasite genetic diversity using MSP1 and MSP2 allelic families was also determined. I am happy to say that we have sufficient amount of DNA for genetic analysis from the kits (n=69).”
- Dr. Magatte Ndiaye,Université Cheikh Anta Diop (University of Dakar), Senegal on the use of OM-501 for temporal dynamics of molecular markers of anti-malarial drug resistance in P. falciparum parasite populations in Senegal.

Conclusions
Given that only 14% of malaria cases are detected globally and several limitations exist to current diagnostic testing methods, there is a need to explore other approaches that enhance malaria diagnostics and national surveillance programs. OMNIgene-DISCOVER is a saliva-based collection/stabilization kit that allows for the non-invasive, proactive sampling and storage of Plasmodium DNA at ambient temperature.

References

Table 1. Patient information, microscopy, mRDT and PCR results.

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<th>ID</th>
<th>Temperature (°C)</th>
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<th>PCR</th>
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“Malaria parasite DNA is present in the saliva of infected individuals and that saliva can be used as an alternative for non-invasive sample for the diagnosis of malaria in a PCR based reaction. This pilot study also proves that the OMNIgene-DISCOVER kit is very effective in preserving malaria DNA at room temperature.”
- Dr. Kenji Obadiah Mfuh

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