Diagnostics and biomarkers

PO - (8562) - SECRETED OKINETE PROTEIN AS A MARKER OF INFECTIOUS BITES FOR ASSESSING TRANSMISSION DYNAMICS AT THE POPULATION LEVEL

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Secreted ookinete protein AS A MARKER of INFECTIOUS BITES

Background: As malaria transmission intensity decline, the heterogeneity in infectious burden become pronounced. There is thus the need for more sensitive tools to identify micro-geographic areas of higher risk for targeted interventions. We sought to evaluate several immunogenic peptides of P. falciparum Secreted ookinete and sporozoite proteins (PSOP24) and and possibly validate specific short sequence immunogenic peptides as an infectious bite markers for assessing malaria transmission intensity and dynamics.

Methods: We conducted four cross-sectional serological and parasitological surveys within one peri-urban and one rural community about 3Km apart, in South-western Ghana. The field surveys were conducted from November 2012 to July 2014 across dry and rainy seasons. Several bioinformatics models were used to predict the immunogenic epitopes of PSOP24 peptides. Total IgG antibody response were determined for three most promising peptides (PSOP24-374, PSOP24-375 and PSOP24-377), together with MSP1\(_n\), CSP and salivary gland antigen. Alongside we determined parasite prevalence and density as well as the Entomological Inoculation Rates.

Result: Peptide PSOP24-377 showed seasonal variation with a 2-fold increase in IgG response in the rainy- high transmission season. This collaborates with the 2-fold increase in IgG response to the mosquito salivary antigen gSG6-P1. Also, PSOP24-377 was able to show a subtle differences from Ayeigbekorpe to Odumase during the dry season and a high sero-prevalence between the two communities during the rainy season. Which was in contrast with gSG6-P1 because while PSOP24-377 measures sero-response to infectious bites, gSG6-P1 measure responses to only vector exposure. The immune response variation determined by PSOP24-377 correlated with parasite prevalence and the entomological inoculation rates.

Conclusion: The preliminary data points to the potential of PSOP24-377 as an infectious bite marker. Which can be exploited as a routine surveillance tool for monitoring malaria transmission at the community level.