Local Manufacturing of Enzymes For The Multiplex Diagnosis of Candidiasis and STIs

Harry Akligoh

The burden of Candidiasis and Sexually Transmitted Infections (STIs) still remains a major health challenge in Ghana, a low and middle income country in Sub-saharan Africa. At present, candidiasis caused by *Candida albicans* account for over 70% of neonatal sepsis and death in Ghana with the prevalence of sexually transmitted infections still far from reaching zero.

The diagnosis of Candidiasis, Neisseria gonorrhoea, Syphilis, and Trichomoniasis in Ghana still rely on microscopy and serology respectively. However, these methods of diagnosis are less sensitive and specific, take several days to weeks to complete and are error prone. On the contrary, molecular based diagnostics are sensitive and specific and take few hours to complete but have expensive components like enzymes which deters their use in mainstream diagnosis.

It is against this background that this project seeks to explore the local biomanufacturing of two off-patent high fidelity DNA polymerases commercially sold with the names of KOD and Phusion. These DNA polymerases will be expressed in a bacterial host, purified in various formulations and used to set up a tailored protocol for a PCR-based  multiplex molecular diagnosis of  *Candida albicans, Neisseria gonorrhoeae, Treponema pallidum and Trichomonas vaginalis* for use in Ghanaian clinics and hospitals.

It is expected that at the end of this study, we collect preliminary data that consolidate our understanding of using locally produced DNA polymerases in setting up multiiplex PCR-based assays for the diagnosis of candidiasis and STIs to drive further development of molecular test kits in the future.